Water-Supply and Irrigation Paper No. 109

Series { M, General Hydrographic Investigations, 13
N, Water Power, 9 }

DEPARTMENT OF THE INTERIOR

UNITED STATES GEOLOGICAL SURVEY

CHARLES D. WALCOTT, DIRECTOR

HYDROGRAPHY

OF THE

SUSQUEHANNA RIVER DRAINAGE BASIN

BY

JOHN C. HOYT AND ROBERT H. ANDERSON

WASHINGTON
GOVERNMENT PRINTING OFFICE
1905

PUBLICATIONS OF UNITED STATES GEOLOGICAL SURVEY.

The publications of the United States Geological Survey consist of (1) Annual Reports; (2) Monographs; (3) Professional Papers; (4) Bulletins; (5) Mineral Resources; (6) Water-Supply and Irrigation Papers; (7) Topographic Atlas of the United States, folios and separate sheets thereof; (8) Geologic Atlas of United States, folios thereof. The classes numbered 2, 7, and 8 are sold at cost of publication; the others are distributed free. A circular giving complete lists may be had on application.

The Professional Papers, Bulletins, and Water-Supply Papers treat of a variety of subjects, and the total number issued is large. They have therefore been classified into the following series: A, Economic geology; B, Descriptive geology; C, Systematic geology and paleontology; D, Petrography and mineralogy; E, Chemistry and physics; F, Geography; G, Miscellaneous; H, Forestry; I, Irrigation; J, Water storage; K, Pumping water; L, Quality of water; M, General hydrographic investigations; N, Water power; O, Underground waters; P, Hydrographic progress reports.

The following Water-Supply Papers are out of stock, and can no longer be supplied: Nos. 1-16, 19, 20, 22, 29-34, 36, 39, 40, 43, 46, 57-65, 75. Complete lists of papers relating to water supply and allied subjects follow. (PP=Professional Paper; B=Bulletin; WS=Water-Supply Paper.)

SERIES I—IRRIGATION.

WS 2. Irrigation near Phœnix, Ariz., by A. P. Davis. 1897. 98 pp., 31 pls. and maps.
WS 5. Irrigation practice on the Great Plains, by E. B. Cowgill. 1897. 39 pp., 11 pls.
WS 9. Irrigation near Greeley, Colo., by David Boyd. 1897. 90 pp., 21 pls.
WS 10. Irrigation in Mesilla Valley, New Mexico, by F. C. Barker. 1898. 51 pp., 11 pls.
WS 13. Irrigation systems in Texas, by W. F. Hutson. 1898. 68 pp., 10 pls.
WS 17. Irrigation near Bakersfield, Cal., by C. E. Grunsky. 1898. 96 pp., 16 pls.
WS 18. Irrigation near Fresno, Cal., by C. E. Grunsky. 1898. 94 pp., 14 pls.
WS 19. Irrigation near Merced, Cal., by C. E. Grunsky. 1899. 59 pp., 11 pls.
WS 23. Water-right problems of Bighorn Mountains, by Elwood Mead. 1899. 62 pp., 7 pls.
WS 32. Water resources of Porto Rico, by H. M. Wilson. 1899. 48 pp., 17 pls. and maps.
WS 43. Conveyance of water in irrigation canals, flumes, and pipes, by Samuel Fortier. 1901. 86 pp., 15 pls.
WS 70. Geology and water resources of the Patrick and Goshen Hole quadrangles, Wyoming, by G. I. Adams. 1902. 50 pp., 11 pls.
WS 71. Irrigation systems of Texas, by T. U. Taylor. 1902. 137 pp., 9 pls.
WS 74. Water resources of the State of Colorado, by A. L. Fellows. 1902. 151 pp., 14 pls.
WS 87. Irrigation in India (second edition), by H. M. Wilson. 1903. 238 pp., 27 pls.
WS 93. Proceedings of first conference of engineers of the reclamation service, with accompanying papers, compiled by F. H. Newell, chief engineer. 1904. 361 pp.

The following papers also relate especially to irrigation: Irrigation in India, by H. M. Wilson, in Twelfth Annual, Pt. II; two papers on irrigation engineering, by H. M. Wilson, in Thirteenth Annual, Pt. III.

SERIES J—WATER STORAGE.

WS 33. Storage of water on Gila River, Arizona, by J. B. Lippincott. 1900. 98 pp., 33 pls.
WS 40. The Austin dam, by Thomas U. Taylor. 1900. 51 pp., 16 pls.
WS 45. Water storage on Cache Creek, California, by A. E. Chandler. 1901. 48 pp., 10 pls.
WS 46. Physical characteristics of Kern River, California, by F. H. Olmsted, and reconnaissance of Yuba River, California, by Marsden Manson. 1901. 57 pp., 8 pls.
WS 58. Storage of water on Kings River, California, by J. B. Lippincott. 1902. 100 pp., 32 pls.
WS 68. Water storage in Truckee basin, California-Nevada, by L. H. Taylor. 1902. 90 pp., 8 pls.
WS 73 Water storage on Salt River, Arizona, by A. P. Davis. 1902. 54 pp., 25 pls.
WS 86. Storage reservoirs of Stony Creek, California, by Burt Cole. 1903. 62 pp., 16 pls.
WS 89. Water resources of Salinas Valley, California, by Homer Hamlin. 1903. 91 pp., 12 pls.
WS 93. Proceedings of first conference of engineers of the reclamation service, with accompanying papers, compiled by F. H. Newell, chief engineer. 1904. 361 pp.

The following paper also should be noted under this heading: Reservoirs for irrigation, by J. D. Schuyler, in Eighteenth Annual, Pt. IV.

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LETTER OF TRANSMITTAL.

Department of the Interior,
United States Geological Survey,
Hydrographic Branch,
Washington, D. C., May 5, 1904.

Sir: I have the honor to transmit herewith a manuscript by John C. Hoyt and Robert H. Anderson, relating to the hydrography of the Susquehanna River drainage basin, and recommend its publication in the series of Water-Supply and Irrigation Papers.

In this paper has been brought together, in such form as to be of use to both the general and the engineering public, all the available hydrographic information in regard to this important area.

It is intended that this paper shall be published in sequence with another (No. 108) entitled "Quality of Water in the Susquehanna River Drainage Basin, by Marshall Ora Leighton, with an Introductory Chapter on Physiographic Features, by George Buell Hollister." The combination of the two papers will make available a large amount of valuable information with reference to the resources of this important river system.

Very respectfully,

F. H. Newell, *Chief Engineer.*

Hon. Charles D. Walcott,
Director United States Geological Survey.

HYDROGRAPHY OF THE SUSQUEHANNA RIVER BASIN.

By John C. Hoyt and Robert H. Anderson.

INTRODUCTION.

A detailed study of the hydrographic features of the Susquehanna River drainage basin has revealed the existence of a large amount of interesting data. These, however, are widely distributed in various publications and manuscripts which are in most cases inaccessible. This paper has been prepared to meet the constant demand for this information from both the general and the engineering public. The general deductions are intended to give the general reader a comprehensive review of the principal conditions which exist in this area, while the base data have been given for the use of the engineer, so that he may make his own deductions and have sufficient data for estimates in hydraulic investigations.

ACKNOWLEDGMENTS.

The records and reports of the United States Geological Survey have been the chief sources from which the data on flow have been obtained. These records have been carefully revised and in many cases recomputed. New rating tables based on all the discharge measurements to date have been prepared and the tables of estimated discharge have been revised to agree with these rating tables. These recomputations will account for the differences between the figures herein presented and many of those in the previous reports, as the latter were prepared from year to year with such information as was available. Special acknowledgment is due to E. G. Paul, resident hydrographer for Pennsylvania, who established the gaging stations and under whose direction the discharge measurements in this State have been made. The stations in New York were established and have been maintained under the direction of R. E. Horton, resident hydrographer for that State.

The base data from which the precipitation tables have been prepared were taken from the published reports of the United States Weather Bureau.

The tables showing the utilized horsepower in 1900 are from manuscript schedules furnished by the manufactures division of the Twelfth Census.

In the preparation of descriptive portions of the paper Vol. XVI of the reports of the Tenth Census (Water Powers, Part I), Rogers's Geology of Pennsylvania, and the Army Engineers' reports have been largely drawn upon.

The annual reports and original records of the Chief of Engineers, United States Army, have furnished valuable information in regard to declivity, and the profiles herewith given are largely based upon them.

The data for McCalls Ferry have been furnished through the kindness of Dr. Cary T. Hutchinson, of New York City, who is interested in the power development at that point and had charge of extensive surveys and studies there in 1902 and 1903. Special mention is due Boyd Ehle and R. H. Anderson, who established and carried on the measurements at the McCalls Ferry gaging station.

Acknowledgment is also due to Frank H. Brundage, H. J. Saunders, L. R. Stockman, and other members of the hydro-computing section of the United States Geological Survey for assistance given in the computations and in other work connected with the preparation of the many tables.

DESCRIPTION OF DRAINAGE AREA.

GENERAL FEATURES.

The Susquehanna River basin is the largest and most important drainage area commercially in the North Atlantic States, although it is not the most important as regards water power. The headwaters of this river system are on the elevated plateau which separates the waters which flow south and east into the Atlantic streams from those flowing north and west into the Mississippi, St. Lawrence, and Great Lakes.

Geologically, this watershed lies in four physiographic divisions: the Allegheny Plateau, the Allegheny Mountains, the Great Allegheny Valley, and the Piedmont Plateau. Its distribution among these provinces is approximately as follows: Allegheny Plateau, 56 per cent; Allegheny Mountains, 31 per cent; Great Allegheny Valley, 6 per cent; Piedmont Plateau, 7 per cent.

As the physical features of the foregoing divisions and the early history of the formation of this basin, as well as the quality of the water, have been fully discussed by Messrs. G. B. Hollister and M. O. Leighton in Water-Supply Paper No. 108, further discussion here is omitted.

The Susquehanna drainage basin, as shown in fig. 1, has a total area of 27,400 square miles. It comprises 21,060 square miles in Pennsylvania, or about 47 per cent of the area of the State; 6,080 square miles in New York, or 13 per cent of the area of the State; 260 square miles in Maryland, or about 2 per cent of the area of the State. It

includes all or a portion of the counties in New York and Pennsylvania listed in the table below:

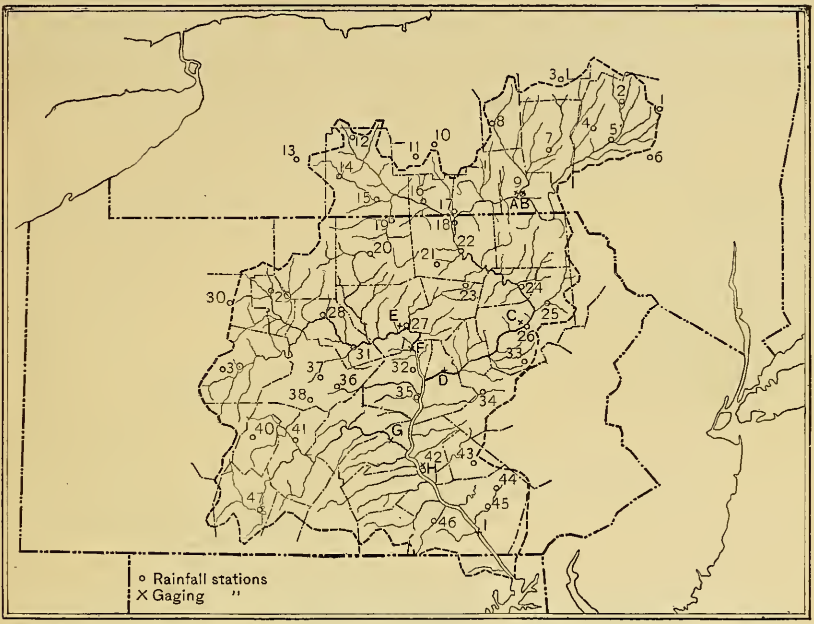

FIG. 1.—Map showing drainage area and location of gaging and rainfall stations.

Counties in New York and Pennsylvania drained wholly or in part by Susquehanna River and its tributaries.

New York:
- Madison.
- Cortland.
- Otsego.
- Chenango.
- Delaware.
- Broome.
- Tioga.
- Tompkins.
- Schuyler.
- Chemung.
- Steuben.

Pennsylvania:
- Potter.
- Tioga.
- Bradford.
- Susquehanna.
- Elk.
- Cameron.
- Clinton.
- Lycoming.
- Sullivan.
- Wyoming.
- Lackawanna.
- Luzerne.
- Columbia.

Pennsylvania—Continued.
- Montour.
- Northumberland.
- Union.
- Center.
- Clearfield.
- Indiana.
- Cambria.
- Blair.
- Huntingdon.
- Mifflin.
- Juniata.
- Snyder.
- Perry.
- Cumberland.
- York.
- Adams.
- Franklin.
- Fulton.
- Bedford.
- Somerset.
- Dauphin.
- Schuylkill.
- Lebanon.
- Lancaster.

In order to simplify the descriptive matter which follows, the following division has been made of the Susquehanna River system: Susquehanna River and its tributaries below mouth of West Branch; Susquehanna River and its tributaries above mouth of West Branch; West Branch of Susquehanna River and its tributaries. The principal streams in each division are shown by the following diagrams:

Tributaries of Susquehanna River below West Branch.

- Shamokin Creek.
- Penn Creek.
- Middle Creek.
- Mahanoy Creek.
- Mahantango Creek.
- Burgess Creek.
- Wiconisco Creek.
- Armstrong Creek.
- Juniata River.
  - Frankstown Branch.
    - Sugar Creek.
    - Canoe Creek.
    - Piney Creek.
    - Clover Creek.
    - Little Juniata.
      - Spruce Creek.
      - Bald Eagle Creek.
    - Shavers Creek.
    - Standing Stone Creek.
  - Raystown Branch.
    - Buffalo Creek.
    - Dunnings Creek.
    - Cove Creek.
    - Shavers Creek.
    - Brush Creek.
    - Yellow Creek.
    - Great Trough Creek.
  - Aughwick Creek.
  - Kishacoquillas Creek.
  - Jacks Creek.
  - Lost Creek.
  - Tuscarora Creek.
  - Cocolanus Creek.
  - Buffalo Creek.
- Powell Creek.
- Shermans Creek.
- Clark Creek.
- Stoney Creek.
- Fishing Creek No. 1.
- Conedoguinet Creek.
- Paxton Creek.
- Yellows Breeches Creek.
- Swatara Creek.
- Conewago Creek.
- Codorus Creek.
- Conestoga Creek.
- Pequea Creek.
- Otter Creek.
- Muddy Creek.

Tributaries of Susquehanna River below West Branch—Continued.

Fishing Creek No. 2.
Broad Creek.
Conowingo Creek.
Octoraro Creek.
Deer Creek.

Tributaries of Susquehanna River above West Branch.

- Otsego Lake.
- Oak Creek, Schuyler Lake.
- Cherry Valley Creek.
- Schenevus Creek.
- Charlotte River.
- Otsego Creek.
- Ouleout Creek.
- Carrs Creek.
- Unadilla River.
  - Butternut Creek.
  - Wharton Creek.
- Bennetts Creek.
- Starucca Creek.
- Salt Lick Creek.
- Snake Creek.
- Chenango River.
  - Castle Creek.
  - Genegantslet Creek.
  - Canaswacta Creek.
  - Tioughnioga River.
    - Eastern branch Tioughnioga.
    - Western branch Tioughniogo.
    - Otselic River.
- Choconut Creek.
- Nanticoke Creek.
- Apalachin Creek.
- Owego Creek.
  - Cottalong Creek.
  - East Creek.
- Wappasening Creek.
- Cayuta Creek.
- Chemung River.
  - Ten Mile Creek.
  - Twelve Mile Creek.
  - Five Mile Creek.
  - Canisteo River.
    - Carr Valley Creek.
    - Crosby Creek.
    - Purdy Creek.
    - Bennetts Creek.
    - Tuscorora Creek.
    - Tioga River.
      - Mill Creek.
      - Crooked Creek.
      - Cowanesque Creek.
  - Hammond Creek.
  - Bucks Creek.
- Sugar Creek.
- Towanda Creek.
- Wysox Creek.
- Wyalusing Creek.
- Tuscarora Creek.
- Meshoppen Creek.
- Mehoopany Creek.

Tributaries of Susquehanna River above West Branch—Continued.

Tunkhannock Creek.
Buttermilk Creek.
Coray Creek.
Gardner Creek.
Abraham Creek.
Mill Creek.
Toby Creek.
Buttonwood Creek.
Warrior Creek.
Newport Creek.
Harvey Creek.
Hunlock Creek.
Shickshinny Creek.
Little Wapwallopen Creek.
Wapwallopen Creek.
Nescopec Creek.
Briar Creek.
Fishing Creek. { Little Fishing Creek. Green Creek. Huntington Creek. }
Catawissa Creek.
Roaring Creek.
Mahoning Creek.

Tributaries of West Branch of Susquehanna River.

Anderson Creek.
Clearfield Creek.
Moshannon Creek.
Mosquito Creek.
Sinnemahoning Creek. { West Creek. Bennetts Brook. East Fork. }
Kettle Creek.
Youngwomans Creek.
Bald Eagle Creek. { Spring Creek. Beach Creek. Fishing Creek. }
Pine Creek. { Marsh Creek. Babbs Creek. Little Pine Creek. }
Big Larrys Creek.
Lycoming Creek.
Loyalsock Creek.
Muncy Creek.
White Deer Hole Creek.
White Deer Creek.
Buffalo Creek.
Chillisquaque Creek.

The following table, compiled from Vol. XVI of the reports of the Tenth Census and from the publications of the United States Geological Survey, shows the drainage area at different points on Susquehanna River and its tributaries.

Drainage areas of Susquehanna River and its tributaries.

Stream.	Tributary to—	Point of measurement.	Drainage area.
			Sq. miles.
Susquehanna River	Chesapeake Bay	Outlet of Otsego Lake.	[a] 81
Do	do	Oak Creek	97
Do	do	Below and including Oak Creek.	212
Do	do	Oneonta	[a] 686
Do	do	Below and including Charlotte River.	713
Do	do	Unadilla River	[a] 914
Do	do	Below and including Unadilla River.	[a] 1,480
Do	do	Nineveh	1,790
Do	do	Susquehanna	2,024
Do	do	Binghamton	[a] 2,400
Do	do	Below and including Chenango River.	[a] 3,980
Do	do	Chemung River	4,940
Do	do	Below and including Chemung River.	[a] 7,460
Do	do	Wilkesbarre	[a] 9,810
Do	do	Danville	[a] 11,070
Do	do	Mouth of west branch	[a] 11,140
Do	do	Sunbury	[a] 18,170
Do	do	Harrisburg	[a] 24,030
Do	do	McCalls Ferry	[a] 26,770
Do	do	Mouth	[a] 27,400
Shamokin Creek	Susquehanna River	do	165
Penn Creek	do	do	361
Middle Creek	do	do	147
Mahanoy Creek	do	do	133
Mahantango Creek	do	do	166
Wiconisco Creek	do	do	83
Clark Creek	do	do	47
Yellow Breeches Creek	do	do	247
Conedogwinit Creek	do	do	450
Swatara Creek	do	do	536
Conewago Creek	do	do	560
Shermans Creek	do	do	232
Pequea Creek	do	do	148

[a] Measured by United States Geological Survey.

Drainage areas of Susquehanna River and its tributaries—Continued.

Steam.	Tributary to—	Point of measurement.	Drainage area.
			Sq. miles.
Conestoga Creek	Susquehanna River	Lancaster	332
Do	do	Mouth	474
Conowingo Creek	do	do	31
Octorara Creek	do	do	178
Deer Creek	do	do	128
Oak Creek	do	do	115
Cherry Valley Creek	do	do	121
Schenevus Creek	do	do	127
Charlotte River	do	do	178
Otego Creek	do	do	106
Oaliout Creek	do	do	115
Unadilla River	do	do	561
Butternut Creek	Unadilla River	do	123
Wharton Creek	do	do	92
Bennetts Creek	Susquehanna River	do	47
Chenango River	do	Canasawacta Creek	297
Do	do	Tioughnioga River	[a] 730
Do	do	Below and including Tioughnioga River.	[a] 1,490
Do	do	Mouth	[a] 1,580
Canasawacta Creek	Chenango River	do	63
Genegantslet Creek	do	do	102
Tioughnioga River	do	Otselic River	[a] 428
Do	do	Mouth	[a] 760
West Branch Tioughnioga River.	Tioughnioga River	do	103
East Branch Tioughnioga River.	do	do	164
Otselic River	do	do	259
Starucca Creek	Susquehanna River	do	75
Owego Creek	do	do	391
Cayuta or Shepards Creek.	do	do	148
Chemung River	do	Elmira	2,110
Do	do	Mouth	2,520
Tioga River	Chemung River	do	1,330
Do	do	Cowanesque Creek	433
Do	do	Canisteo River	776
Canisteo River	do	Mouth	545
Tuscarora Creek	do	do	120
Cowanesque Creek	Tioga River	do	288

[a] Measured by United States Geological Survey.

Drainage areas of Susquehanna River and its tributaries—Continued.

Steam.	Tributary to—	Point of measurement.	Drainage area.
			Sq. miles.
Sugar Creek	Susquehanna River	Mouth	177
Towanda Creek	do	do	220
Wysox Creek	do	do	90
Wyalusing Creek	do	do	204
Tunkhannock Creek	do	do	409
Lackawanna Creek	do	do	323
Little Wapwallopen Creek.	do	do	38
Big Wapwallopen Creek	do	do	68
Nescopec Creek	do	do	145
Catawissa Creek	do	do	131
Fishing Creek	do	do	353
West Branch Susquehanna River.	do	Clearfield Creek	476
Do	do	Sinnemahoning Creek	1,440
Do	do	Queens Run	3,030
Do	do	Lock Haven	3,040
Do	do	Williamsport	[a]5,640
Do	do	Allenswood	[a]6,540
Do	do	Mouth	[a]7,030
Clearfield Creek	West Branch Susquehanna River.	do	342
Moshannon Creek	do	do	233
Mosquito Creek	do	do	54
Sinnemahoning Creek	do	Benezette	163
Do	do	Driftwood	334
Do	do	Mouth	962
Trout Run	Sinnemahoning Creek	do	48
Driftwood Branch	do	do	314
First Fork	do	do	240
Kettle Creek	West Branch Susquehanna River.	do	215
Bald Eagle Creek	do	do	726
Beach Creek	Bald Eagle Creek	do	157
Fishing Creek	do	do	169
Spring Creek	do	do	148
Pine Creek	West Branch Susquehanna River.	do	930
Big Larrys Creek	do	do	85
Lycoming Creek	do	do	261

[a] Measured by United States Geological Survey.

Drainage areas of Susquehanna River and its tributaries—Continued.

Stream.	Tributary to—	Point of measurement.	Drainage area.
			Sq. miles.
Loyalsock Creek	West Branch Susquehanna River.	Mouth	494
Muncy Creek	do	do	185
White Deer Creek	do	do	40
Chillisquaque Creek	do	do	119
Juniata River	Susquehanna River	Junction of and including its two branches.	1,842
Do	do	Newton Hamilton	2,270
Do	do	Lewistown dam	2,550
Do	do	Newport	[a] 3,480
Do	do	Mouth	[a] 3,530
Raystown Branch	Juniata River	Hopewell	588
Do	do	Mouth	909
Frankstown Branch	do	Holidaysburg	129
Do	do	Crooked dam	249
Do	do	Threemile dam	273
Do	do	Williamsburg	279
Do	do	Mud dam	333
Do	do	Smokers dam	333
Do	do	Donnellys dam	342
Do	do	Willow dam	347
Do	do	Water Street dam	356
Do	do	Alexandria	360
Do	do	Little Juniata	374
Do	do	Pipers dam	750
Do	do	Huntingdon dam	759
Do	do	Mouth	933
Standingstone Creek	Frankstown Branch	do	129
Shavers Creek	do	do	45
Little Juniata River	do	Tyrone (including Bald Eagle Creek).	154
Do	do	Barree	325
Do	do	Mouth	327
Spruce Creek	Little Juniata River	do	94
Bald Eagle Creek	do	do	54
Great Aughwick	Juniata River	do	316
Kishacoquillas Creek	do	do	174
Jacks Creek	do	do	55
Tuscarora Creek	do	do	252

[a] Measured by United States Geological Survey.

A. TYPICAL VIEW ON SUSQUEHANNA RIVER NEAR CATAWISSA, PA.

B. BED OF SUSQUEHANNA RIVER AT McCALLS FERRY CABLE STATION, DURING LOW WATER.

SUSQUEHANNA RIVER BELOW WEST BRANCH.

Susquehanna River is joined by the West Branch at Sunbury, Northumberland County. Below this point the river drains an area of 9,230 square miles. It flows nearly south, between Northumberland, Dauphin, and Lancaster counties on the east and Snyder, Juniata, Perry, Cumberland, and York counties on the west, passing then into Maryland, where it flows between Cecil County on the east and Harford County on the west, and empties into Chesapeake Bay at its northern extremity.

Below the mouth of the West Branch the fall becomes more irregular than above, and there are rapids where the stream flows over a rocky bottom. In the lower part of its course from Marietta to Havre de Grace the river occupies a deep valley, varying in width from a few hundred yards to more than 2 miles, and on either shore it is for the most part bounded by rocky bluffs surmounted by a tableland 100 to 500 feet above the stream. The channel is in many places filled with small rocky islands, some of which are cultivated. Pls. I, *B*, and VIII show typical views of this part of the river.

The fall of the main river is rapid. Its elevation at the mouth of the West Branch is about 400 feet above mean sea level at Havre de Grace. The distance between this point and Havre de Grace is about 125 miles, hence the mean slope of the main river is nearly $3\frac{1}{2}$ feet per mile. The slope is, however, extremely variable, being over 5 feet per mile in the lower 40 miles and about $2\frac{1}{2}$ feet per mile in the upper 40 miles. The change in slope takes place as the river passes from the Allegheny Mountain and the Allegheny Valley regions to the Piedmont Plateau region.

The tables on pages 207–210 give the elevation of the river and its branches at various points, and Pls. XXVIII and XXIX show their profiles.

This part of the river is described by Prof. H. D. Rogers as follows:[a]

Between Northumberland and the Kittatinny Valley the river leads us through many striking scenes. It is studded with many little islands, most of which are covered with trees or bushes to the water's edge, and it is here a wide and majestic river, flowing alternately for long reaches across highly cultivated belts of country and past the ends of steep and rugged mountains. Passing out from the mountains it traverses a beautiful country in the Kittatinny Valley, dividing Dauphin from Cumberland County. Quitting the limestone valley the river next traverses the red-shale belt, between the villages of Highspire and Bainbridge, crossing a rather monotonous country, except at the Conewago Falls, or rapids, where numerous hard trap dikes impede its course and cause it to rush in wild tumult, by deep and dangerous sluices, for a long distance between black and jutting reefs. At Chickies Ridge, 1 mile above Columbia, the river leaves the smoother country and passes between a range of high and picturesque crags. With two or three intermissions, caused by the softer limestone valleys which it next crosses, it runs the whole way thence to the vicinity of Port Deposit, or nearly to the Chesapeake Bay, between steep naked and half naked hillsides, rising

[a] Geol. Pennsylvania, p. 49.

from 200 to 400 feet above its channel. In some parts of this long reach, as at Washington Borough, the river is greatly dilated and is filled with rocky islands and projecting reefs. In other localities its rugged banks approach, and the river rushes with tremendous force, especially during freshets, through these deeper gorges. The traveler, who finds only a rough and very toilsome path along its eastern shore from Turkey Hill to Port Deposit, a distance of more than 30 miles, will choose to descend it by its right bank along the towpath of the canal. He will pass an almost unbroken succession of interesting rocky scenes, affording much geological instruction, and he will witness many beautiful bits of river perspective, but he will find himself pent in all the way between the bold river hills.

The principal tributary below the West Branch is the Juniata, which has its source in Bedford, Blair, and Somerset counties, Pa., at an elevation of about 2,000 feet above sea level. The divide between its waters and those of the Ohio attains in places a height of nearly 2,800 feet. The valley of the stream is narrow and the banks are generally high. The stream has a number of both large and small tributaries. Doctor Rogers describes the Juniata as follows:[a]

This second great tributary of the Susquehanna has two chief upper divisions, the Frankstown and the Raystown branches, both of which, like the main stream below their junction, traverse much beautiful scenery. We will trace the Frankstown Branch as that which is most accessible. After gathering its headwaters from the eastern slope and the foothills of the Allegheny Mountains it begins to assume the volume of a small river near Frankstown. Below this point it first passes the cove of the Lock Mountain, a curious district of conical hills, in structure like the Muncy Hills of the West Branch. Its course is now by a wild and rocky gorge through the Lock or Canoe Mountain into Canoe Valley. Winding northeastward through this valley it next goes through Tusey Mountain into Hartslog Valley by an interesting curving pass of the form of the letter S. The mountain, which consists of two ridges, is trenched along its center for the passage of the river, and the western ridge is, moreover, breached at Water street by a lateral notch, which gives passage to a small tributary stream and heightens much the picturesqueness of the place, which is further enhanced by a great stone slide covering the ends of the mountain. Crossing Hartslog Valley it next traverses Warrior Ridge, passing by the Pulpit Rocks. Emerging from the Warrior Ridge and deflecting more toward the east it crosses the Huntingdon Valley and passes by the northern end or knob of Terrace Mountain or Slideling Hill, receiving first the Raystown Branch, which nearly doubles the volume of its waters. Here, bending southward, it follows a picturesque gap through Stone Ridge, and turning more eastward it presently enters the deep cleft in Jacks Mountain called "Jacks Narrows," upon the western side of which the mountain is covered with a great stone slide or field of naked angular blocks of sandstone, which imparts a most desolate aspect to the pass, especially when the forest is not in leaf.

On emerging from Jacks Narrows the river crosses a succession of open valleys divided by narrow ridges until it meets the base of Blue Ridge in Sugar Valley. There it makes a great loop, turning in an oxbow backward till it reaches Newton Hamilton, where it flows with many large sinuosities longitudinally through the Juniata or Lewistown Valley to the deep synclinal ravine called the "Long Narrows," formed by the near approach of the Blue and Shade mountains. The Long Narrows of the Juniata is a narrow trough between mountain ridges, deeply trenched on their flanks and thickly clothed with timber on their lower slopes and

[a] Geol. Pennsylvania, p. 50.

at their base, and overspread nearer their summits with extensive sloping sheets of dark-gray angular blocks. The pass is 7 miles long and is one of the wildest and most impressive within the mountains. At the eastern end of the Long Narrows the river turns southeastward and winds between hills and valleys across the country to the base of the Tuscarora Mountain, passing Mifflintown, Mexico, and other villages. Below New Mexico it sweeps the base of the Tuscarora Mountain for several miles, until it turns abruptly across its eastern end a mile northwest of Millerstown. Below Millerstown the river crosses the Wildcat and Buffalo valleys, washing the end of the Buffalo Mountain. Pursuing its course, the Juniata. after making two or three bends, flows through a belt of hills called the "Half-Fall Mountain," where, as at nearly all its passes through the larger sandstone ridges, it is impeded by ledges of hard strata and thrown into ripples or rapids. From the Half-Fall Rapids it flows between steep but low cliffs and hills for about 4 miles farther, to its entrance into the main Susquehanna at Duncans Island, having followed a winding course entirely across the central zone of the Appalachian chain through a distance of nearly 200 miles.

SUSQUEHANNA RIVER ABOVE WEST BRANCH.

This portion of the stream and its tributaries drain an area of about 11,140 square miles, of which 6,080 are in New York and 5,060 in Pennsylvania. It rises in Otsego Lake, in Otsego County, N. Y., which is about 7½ miles long and 1½ miles wide, and has an elevation of about 1,193 feet above sea level. It flows in a southwesterly direction through Otsego, Chenango, and Broome counties, N. Y., into Susquehanna County, Pa. It then flows in a westerly-northwesterly direction through this county and again enters New York and takes a westerly course through Broome and Tioga counties to near the western boundary of Tioga County, where it turns south and enters Pennsylvania. Before leaving New York its volume is rapidly swelled by many large tributaries. After entering Pennsylvania the second time it flows through Bradford, Wyoming, Luzerne, Columbia, Montour, and Northumberland counties to its junction with the West Branch, above Sunbury.

This portion of the drainage basin is varied in character. In New York it is a rolling and sometimes rather broken country, forming the plateau bounding the mountain region on the north. The stream has a very uniform declivity in this part of its course and offers comparatively little power. Its bed is gravel or sand, with an occasional rocky ledge. Its banks are moderately high, shelving, and are subject to overflow only in extreme freshets.

After it enters Pennsylvania it flows through the mountain regions, and its course is in many places tortuous as it winds along the parallel ranges of hills. In general, however, its fall is gradual, its bed being composed mostly of drift materials—gravel, sand, and bowlders. The banks, as in New York, are generally high and are seldom overflowed, although the river has an extreme rise of as much as 30 feet.

In this portion of the drainage area is located the great Lackawanna and Wyoming coal basin, and J. H. Dager reported upon this, in sub-

stance, as follows:[a] This basin extends from Nanticoke on the southwest, where the river emerges from the Coal Measures, to Carbondale on the northeast. It is about 50 miles in length and averages 3½ miles in width. It is surrounded by the Allegheny Mountains, which are composed of the Catskill formation and rocks of the Carboniferous system.

In this vicinity there are several workable seams of coal, ranging from 3 to 14 feet in thickness and at depths varying from nothing to 800 feet. These seams are from 10 to 200 feet apart vertically, and are underlain by sandstone and fire clay.

From the outcrop of the Coal Measures just above Pittston to the New York State line the country is traversed by long, narrow, parallel ranges of mountains whose axes are nearly at right angles to the general direction of the river. At bends on the convex side there rise from the shore abrupt cliffs from 200 to 400 feet in height, opposite which, with one or two exceptions, are gently sloping cultivated lands.

Professor Rogers refers to this portion of the river as follows:[b]

That portion of the Susquehanna River which flows near the northern boundary of the State passes from its sharp elbow, called the "Great Bend," to the mouth of its affluent, the Chemung River, through a charming, broad valley, bounded by soft slopes terminating in wide, table-shaped hills. It is a fertile and very beautiful district, and with its westward extension, the plain of the Chemung River, is rapidly becoming one of the most attractive agricultural districts of New York. From the mouth of the Chemung River to Pittston, where the river suddenly turns at a right angle on entering the Wyoming coal field, it flows, with many bendings, along a deep and picturesque valley, almost identical in its features with that of the corresponding stretch of the Delaware, the main difference being that the bed of the valley is wider and the hillsides confining it less mountainous. From the mouth of the Lackawanna, at Pittston, where it enters, to Nanticoke, where it leaves the beautiful Wyoming Valley, the scenery along the river is wholly different. It flows through a broad and almost perfectly level, smooth plain—the Wyoming and Kingston flats—composed of a deep bed of diluvium or drift. On either side of this plain rise the rolling hills of the coal basin, and behind these the long, gentle slopes of the high mountain barriers, which frame in the whole scene. At Nanticoke the river turns abruptly northward out of the coal basin, through its steep barrier, by a highly picturesque pass, and then sweeps again as suddenly westward to run for several miles in a closely confined trench between the outer and the inner ridges of the basin. It does not, however, run round the western end of this, but at the ravine of the Shickshinny turns suddenly southward and cuts across its point, leaving a high, isolated hill of the coal strata on its western or right-hand side. Disengaging itself by a fine pass from the southern barrier of the coal basin, it passes out into an open valley and makes another rectangular bend, to run once more toward the west, parallel with the Nescopeck Mountain, which it follows to the neighborhood of Catawissa. Beyond this point it maintains its general course westward, somewhat south, parallel with the southern base of Montour Ridge, all the way to Northumberland, where it is joined by its great tributary, the West Branch. In some portions of this long reach of the river the scenery adjoining it is uncommonly rich and pleasing. A remarkably fine view up the river is presented from the hills on its west bank, a little below the mouth of Fishing Creek.

[a] Ann. Rept. Chief of Engineers, U. S. Army, 1884, pt. 1, p. 873. [b] Geol. Pennsylvania, p. 48.

WEST BRANCH OF SUSQUEHANNA RIVER.

The drainage basin of the West Branch has an area of approximately 7,030 square miles, all of which is in Pennsylvania. The West Branch has its sources in the mountains of Cambria County at an elevation of not less than 2,000 feet above sea level. It flows first in a northward direction, receiving some tributaries from Indiana County on the west, into Clearfield County. Gradually bending to the right, it flows northeast between Center and Clinton counties, east through Clinton and Lycoming counties, and south between Union and Northumberland to join the main stream above Sunbury, Pa.

The watershed of this stream occupies the high table-lands of the north-central part of Pennsylvania. The crest of the watershed has an elevation of from 500 to 1,200 feet above sea level in the vicinity of the junction of the West Branch and the main stream, increasing to about 2,200 feet at its southwestern part; thence along its western side it maintains this latter elevation to its northern line, where, in the northern part of the Pine Creek basin, it attains an elevation of over 2,600 feet. Along the remainder of the northern crest the height quickly falls to about 1,200 feet, but rises again to about 2,000 feet along the eastern crest of the divide. The highest points in the State are along the crest of this watershed.

As far up as Queens Run the fall of this branch is comparatively small, while above that point, in the mountain region, it is much greater. Furthermore, the banks of both the stream and its tributaries above Queens Run are generally high, and there are few low grounds subject to overflow. Below Queens Run the river traverses a wide, fertile valley, without, however, overflowing its banks to any considerable extent. The bed of the river is generally gravel and sand, with a rocky ledge at places. In former years this portion of the drainage was largely used by lumbermen for floating logs. On most of the streams splash dams were built, sometimes flooding considerable areas, and serving to hold the logs which were sent down until a sufficient number were collected. The gates in the dam were then raised, letting the water out suddenly, so that the logs were carried down on the swell or wave to the next dam or to the main river, where the natural current would be sufficient to carry them along. As the forest areas are now largely cut off, but very little logging is done either on this or other portions of the river.

Professor Rogers describes this branch of the river as follows:[a]

The upper part of the West Branch of the Susquehanna, and also its tributaries, the Sinnemahoning, Kettle Creek, Pine Creek, etc., draining the high plateau northwest of the Allegheny Mountains, flow through deep trenches in the horizontal strata, very analogous in their features to those which give passage to the Delaware and the Main or North Susquehanna, in the northeastern part of the State. From the mouth of the Sinnemahoning out into the Bald Eagle Valley,

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[a] Geol. Pennsylvania, p. 49.

the river hills are very high and steep, and admit extremely narrow strips of ground between their feet and the river, except near the openings of the lateral streams. The trough through which the lower half of Pine Creek flows is equally profound. Entering the valley between the Allegheny Mountains and the Bald Eagle ridge, the river pursues a beautiful winding course the whole way from Lockhaven to the neighborhood of Muncy, alternately sweeping toward the middle of the cultivated valley and back again, close in to the base of the steep and wood-covered ridge. Near Muncy it turns with a broad majestic curve round the end of the Bald Eagle Mountains, and in a few miles deflects from a southwest to a west course, through a highly fertile, richly cultivated open country, till it strikes the base of the Blue Hill, or range of red sandstone cliffs above Northumberland. Southwest of Muncy the river crosses a singular belt of deeply eroded country, full of conical hills.

NAVIGATION.

Information in regard to navigation along Susquehanna River and its tributaries is now only of historical interest. The official records of Pennsylvania and other papers published during the early part of the century show that from the first settlement Susquehanna River and its tributaries were regarded as a possible means of navigation.

In this relation the following quotation from Dager's report is of interest:[a]

General Sullivan, to punish the Six Nations, late in August, 1779, organized a force of 3,000 men and moved north from Wyoming, the artillery and stores being drawn up the North Branch in 150 boats. At Tioga he was joined by General Clinton with 1,000 New York troops. The latter had marched from Albany to Otsego Lake, where, finding the water too low to flo t his bateaux, he built a dam across the stream, by which the lake was raised several feet, and when the dam was cut away the discharge wave floated his boats down to Tioga.

The Indians fled in dismay at the sight of a flood in the midst of the summer drought, believing it a signal of the displeasure of the Great Spirit. From this might be inferred that Otsego Lake could be made a reservoir to pay tribute to the river when there was an insufficient flow.

On March 9, 1777, an act was passed declaring Susquehanna River a public highway as far down as Wrights Ferry, and later on, March 31, 1785, the whole river through Pennsylvania was declared a public highway. An appropriation of £6,290 was made as early as April 11, 1791, for the improvement of the navigation of Susquehanna River. Other appropriations were made from time to time and active canals were maintained from Havre de Grace to the New York State line, on the West Branch from Northumberland to Lock Haven, and on the Juniata from Juniata Junction to Holidaysburg.

Between 1800 and 1830 several plans were proposed for connecting Susquehanna River with the Great Lakes and with Mississippi River. Nothing, however, came of any of these projects, and with the coming of the railroads the canals were gradually abandoned, being in most cases bought by the railroad companies. The North Branch extension, from the New York State line to Pittston, was abandoned in 1868 or 1869. The canal from Pittston down was used more or less

[a] Ann. Rept. Chief of Engineers, U. S Army. 1884, pt. 1, p. 876.

until the fall of 1874, but the high floods of the spring of 1875 caused so much damage that no boats were run after that date above Wilkesbarre. The Lackawanna Canal served as a feeder for the Wilkesbarre Branch until the spring of 1882, when it was abandoned to the Nanticoke dam. The canals below Sunbury were abandoned about 1890.

MEASUREMENTS OF FLOW.

The records of the measurements of flow in the Susquehanna drainage have been divided into two classes: First, those at regular stations, where systematic observations have been carried on over a series of years; second, those at miscellaneous stations, which consist of short or broken series of observations. There have been nine regular stations maintained, as given in the following list:

Gaging stations in the Susquehanna drainage basin.

	Stream.	Location.	Date established.	Established by—
A	Susquehanna	Binghamton, N. Y	Aug. 1, 1901	United States Geological Survey.
B	Chenango	do	do	Do.
C	Susquehanna	Wilkesbarre, Pa	Mar. 30, 1899	Do.
D	do	Danville, Pa	Mar. 25, 1899	Do.
E	West Branch	Williamsport, Pa	Mar. 4, 1895	City engineer.
F	do	Allenwood, Pa	Mar. 25, 1899	United States Geological Survey.
G	Juniata	Newport, Pa	Mar. 21, 1899	Do.
H	Susquehanna	Harrisburg, Pa	Mar. 21, 1890	Water board.
I	do	McCalls Ferry, Pa	May 17, 1902	Cary T. Hutchinson.

The locations of these stations are shown on fig. 1 (p. 11) by the letters in column 1 of the above table.

Miscellaneous records have been collected at the following points:

Chemung River at Chemung, N. Y.
Tioughnioga River at Chenango Forks, N. Y.
Cayuta Creek at Waverly, N. Y.
Chenango River at Oxford, N. Y.
Eaton and Madison creeks.
Diversions from Chenango River drainage.

The following pages give the data which have been collected at both regular and miscellaneous stations, also the results of the computations based upon these data.

SUSQUEHANNA RIVER AT BINGHAMTON, N. Y.

This gaging station was established by R. E. Horton July 31, 1901. The gage is located on the upstream side of the left span of the Washington street bridge. The bench mark is a chiseled draft on the corner of the left abutment on the upstream side. Its elevation

is 23.71 feet above gage datum. This bridge is located about 800 feet upstream from the junction of Chenango and Susquehanna rivers. A rift extends diagonally across the stream underneath the bridge. The gage is above a stretch of smooth water extending from the crest of the rift to the dam 2,800 feet upstream, and the gage readings are not affected by backwater from Chenango River at ordinary stages. On account of unfavorable conditions of Washington Street Bridge discharge measurements are made at Exchange Street Bridge, which is 1,900 feet upstream. At this place the channel is about 300 feet wide at low water and about 450 feet wide at high water, and is straight

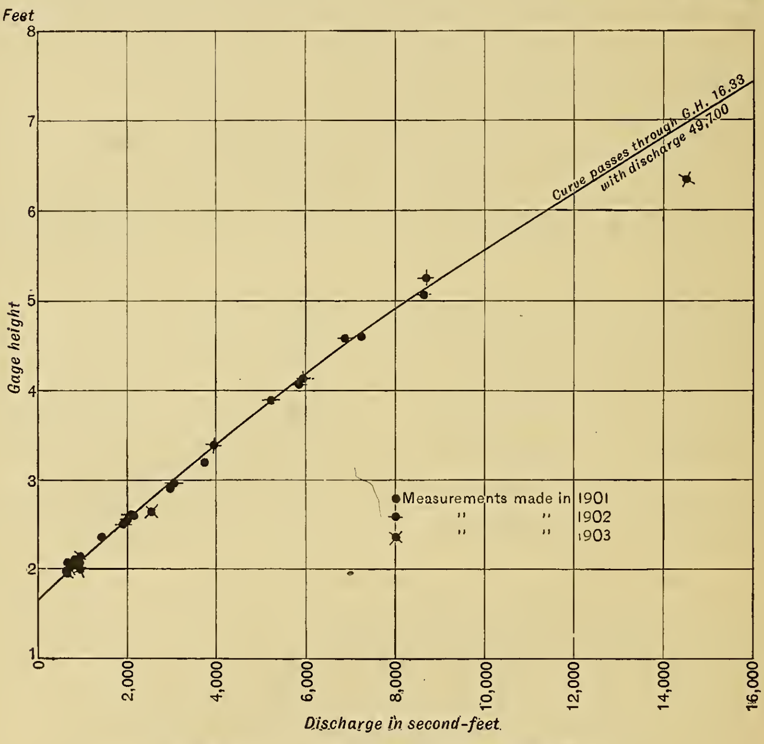


FIG. 2.—Rating curve for Susquehanna River at Binghamton, N. Y.

for about 500 feet above and below the bridge. The bed is naturally gravel and small stones. Formerly a wooden footbridge was located at this point, and the channel was divided into three parts by two piers. Large stones were piled around the piers. At present a steel bridge occupies this site, and there is but one pier, above which are two rows of short piles and a quantity of small stones. The upper parts of the old piers have been removed, but the stone filling around them remains, leaving the river bed irregular and rough.

The velocity is good at low water and swift at high water. The lowest observed mean velocity is 0.72 foot per second.

Within the time for which this record has been kept, the gage height has ranged between 1.84 and 19.22 feet, and the estimated discharge between 400 and 60,300 cubic feet per second.

The gage is read twice daily by E. F. Weeks.

Discharge measurements of Susquehanna River at Binghamton, N. Y., 1901–4.

Date.	Hydrographer.	Area.	Mean velocity.	Gage height.	Discharge.
		Square feet.	*Feet per second.*	*Feet.*	*Second-feet.*
1901.					
July 3	E. C. Murphy	891	1.06	2.12	947
July 10	do	1,020	1.40	2.35	1,425
July 30	do	847	.72	1.99	608
August 20	do	909	1.04	2.05	942
August 20	do	923	1.03	2.06	952
August 21	do	1,989	3.65	4.60	7,244
August 22	do	1,439	2.61	3.19	3,752
August 22	do	1,324	2.25	2.90	2,983
August 23	do	1,189	1.83	2.60	2,176
1902.					
July 2	E. C. Murphy	1,790	3.26	4.08	5,839
July 4	do	1,717	3.28	3.90	5,230
July 14	do	1,320	2.32	2.96	3,064
August 3	do	2,187	3.95	5.08	8,633
August 4	do	1,952	3.53	4.59	6,902
August 15	do	1,140	1.85	2.61	2,105
August 16	do	1,103	1.74	2.50	1,920
1903.					
April 7	E. C. Murphy	1,773	3.35	4.13	5,946
May 15	do	794	.96	2.05	763
May 19	do	746	.86	1.96	640
June 13	C. C. Covert	2,293	3.80	5.25	8,726
August 22	do	1,241	2.07	2.65	2,572
September 3	do	544	1.81	2.00	948
October 1	H. H. Halsey	889	1.08	2.14	962
October 11	C. C. Covert	6,446	7.71	16.32	49,707
October 13	do	2,944	4.94	6.35	14,566
1904.					
March 8	C. C. Covert	3,975	3.58	[a] 11.24	14,254
March 12	do	2,846	2.60	[a] 7.90	7,400
April 8	R. E. Horton	2,524	4.50	6.94	11,118
July 13	C. C. Covert	736	1.07	2.04	786
September 10	do	825	1.29	2.13	1,061

[a] Ice gorge 3 miles below.

Mean daily gage height, in feet, of Susquehanna River at Binghamton, N. Y., 1901–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	------	------	------	------	------	----	------	1.84	2.21	2.19	2.04	2.49
2	------	------	------	------	------	------	------	1.96	2.16	2.19	2.02	2.49
3	------	------	------	------	------	------	------	1.91	2.16	2.16	1.94	2.64
4	------	------	------	------	------	------	------	1.86	2.21	2.16	1.94	2.56
5	------	------	------	------	------	------	------	1.86	2.18	2.14	1.96	2.64
6	------	------	------	------	------	------	------	1.86	2.16	2.06	1.94	2.44
7	------	------	------	------	------	------	------	1.86	2.06	2.04	1.94	2.32
8	------	------	------	------	------	------	------	1.91	2.04	1.99	1.94	2.34
9	------	------	------	------	------	------	------	1.91	2.04	2.04	1.92	2.44
10	------	------	------	------	------	------	------	1.86	1.96	1.99	1.94	5.21
11	------	------	------	------	------	------	------	1.94	1.98	2.02	1.92	6.12
12	------	------	------	------	------	------	------	1.94	2.06	1.96	1.96	5.32
13	------	------	------	------	------	------	------	1.91	2.04	1.99	2.49	------
14	------	------	------	------	------	------	------	1.96	2.01	2.06	2.96	4.62
15	------	------	------	------	------	------	------	1.94	2.08	2.14	2.79	14.86
16	------	------	------	------	------	------	------	1.94	2.16	2.32	2.54	13.74
17	------	------	------	------	------	------	------	1.96	2.21	2.39	2.44	9.24
18	------	------	------	------	------	------	------	2.11	2.36	------	2.42	5.66
19	------	------	------	------	------	------	------	2.16	2.36	2.26	2.36	4.29
20	------	------	------	------	------	------	------	2.06	2.34	2.24	2.39	3.46
21	------	------	------	------	------	------	------	3.66	2.24	2.24	2.39	2.96
22	------	------	------	------	------	------	------	2.98	2.16	2.26	2.32	2.76
23	------	------	------	------	------	------	------	2.61	2.06	2.24	2.29	3.74
24	------	------	------	------	------	------	------	4.51	2.06	2.19	2.71	4.66
25	------	------	------	------	------	------	------	3.86	2.06	2.14	3.42	3.96
26	------	------	------	------	------	------	------	3.21	2.04	2.09	2.94	3.32
27	------	------	------	------	------	------	------	2.78	2.00	2.06	2.52	3.26
28	------	------	------	------	------	------	------	2.46	------	2.06	2.24	2.86
29	------	------	------	------	------	------	------	2.36	2.02	2.04	2.34	2.89
30	------	------	------	------	------	------	------	2.26	2.04	2.04	2.39	3.69
31	------	------	------	------	------	------	1.91	2.31	------	2.06	------	4.06
1902.												
1	3.22	2.56	15.59	5.20	2.85	2.35	5.10	4.90	2.13	4.57	4.60	2.75
2	3.39	2.54	19.22	5.10	2.85	2.37	4.23	5.94	2.13	4.25	4.07	2.70
3	3.22	2.56	17.69	4.87	2.75	2.30	3.60	5.27	2.13	3.67	3.70	2.85
4	3.56	3.24	13.79	4.55	2.65	2.63	3.87	4.51	2.15	3.35	3.47	3.10
5	3.22	2.96	9.19	4.20	2.65	3.07	3.43	3.77	2.13	2.90	3.27	3.33
6	3.14	2.66	6.36	------	2.67	2.85	3.97	3.45	2.07	2.93	3.13	3.18
7	3.02	2.72	5.59	3.90	2.57	2.63	4.43	3.37	2.05	2.83	3.07	2.93
8	2.82	2.74	5.34	3.83	2.53	2.57	4.35	3.10	2.10	2.77	3.00	2.77
9	2.66	2.79	5.04	4.75	2.45	2.65	4.00	2.97	2.07	2.75	2.83	2.73
10	2.54	2.72	5.74	5.40	2.45	2.60	4.03	2.83	2.25	2.67	2.77	2.85
11	2.52	2.84	5.59	5.70	2.35	2.47	4.77	2.73	2.25	2.55	2.70	2.83
12	2.46	2.64	7.81	5.45	2.33	2.47	4.37	2.75	2.25	2.67	2.65	2.95
13	2.57	2.42	11.19	5.03	2.30	2.57	3.43	2.80	2.23	2.77	2.65	2.83
14	2.46	2.34	11.94	4.70	2.30	2.57	3.03	2.75	2.15	2.90	2.75	2.67
15	2.34	2.24	10.61	4.35	2.27	2.65	2.75	2.59	2.15	2.90	2.67	2.75
16	2.32	2.26	8.42	3.97	2.25	2.65	2.70	2.49	2.10	2.87	2.55	2.93
17	2.24	2.19	11.82	3.70	2.25	2.53	2.63	2.40	2.05	2.75	2.55	7.13
18	2.22	2.14	11.87	3.53	2.15	2.55	2.65	2.35	2.05	2.60	2.53	7.65
19	2.42	2.16	9.47	3.37	2.15	2.50	2.65	2.30	2.05	2.50	2.47	6.70
20	2.64	2.16	6.82	3.17	2.15	2.50	7.27	2.30	2.00	2.60	2.50	5.87
21	2.14	2.19	5.72	3.07	2.25	2.45	10.90	2.35	1.95	2.75	2.45	5.28
22	2.56	2.12	5.49	2.97	2.33	2.47	11.35	2.35	1.95	2.73	2.45	9.45
23	4.76	2.24	5.61	2.85	2.35	2.57	10.00	2.27	2.00	2.57	2.47	10.62
24	5.16	2.29	5.76	2.67	2.25	2.50	8.90	2.27	1.97	2.53	2.45	8.20
25	4.22	2.16	5.44	2.63	2.20	2.37	8.10	2.25	2.00	2.53	2.47	6.28
26	3.39	2.12	4.92	2.55	2.37	2.27	6.37	2.25	2.35	2.50	2.53	5.63
27	3.14	2.42	4.56	2.50	2.55	2.37	5.40	2.20	2.63	2.45	2.70	4.98
28	3.67	5.46	4.44	2.53	2.53	2.37	7.51	2.25	2.55	5.95	2.85	4.48
29	4.02	------	5.30	2.53	2.47	2.85	6.07	2.27	5.00	8.30	2.90	3.95
30	3.34	------	5.70	2.60	2.40	6.98	5.00	2.30	3.80	7.15	2.83	3.89
31	2.86	------	5.53	------	2.35	------	5.55	2.17	------	5.53	------	3.63

Mean daily gage height, in feet, of Susquehanna River at Binghamton, N. Y., 1901-1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	3.40	8.60	12.92	6.65	2.33	1.85	3.35	2.55	6.55	2.07	3.25	2.62
2	3.30	7.20	10.82	5.85	2.27	1.87	3.00	2.43	5.17	2.13	3.07	2.69
3	3.70	7.23	7.75	5.15	2.25	1.85	2.73	2.30	4.30	2.15	2.95	2.65
4	5.15	8.27	6.17	5.05	2.25	1.80	2.57	2.25	3.70	2.10	2.85	2.65
5	5.33	9.60	5.63	4.80	2.23	1.83	2.45	2.50	------	2.13	2.85	2.62
6	4.63	7.95	6.43	4.33	2.20	1.80	2.35	3.17	------	2.25	3.05	2.47
7	3.83	6.35	6.30	4.17	2.17	1.77	2.27	3.25	------	2.35	3.17	2.52
8	3.75	5.00	6.35	4.95	2.15	1.85	2.25	3.03	2.70	2.70	2.97	2.52
9	3.45	4.65	10.75	5.63	2.15	1.80	2.20	2.80	2.67	7.97	2.85	2.57
10	6.05	4.33	10.55	5.05	2.10	1.80	2.17	2.63	2.55	15.49	2.75	2.29
11	5.55	4.20	11.55	4.70	2.05	1.80	2.13	2.73	2.65	16.35	2.72	2.45
12	5.93	5.47	11.47	4.40	2.05	2.77	2.10	2.83	2.67	12.12	2.67	2.55
13	6.00	6.95	9.57	4.03	2.05	5.35	2.10	2.70	2.60	8.17	2.62	2.65
14	6.07	6.07	7.75	3.73	2.05	3.45	2.07	2.60	2.50	5.99	2.59	3.17
15	5.85	4.97	6.65	4.05	2.05	3.03	2.13	2.55	2.37	5.09	2.52	3.22
16	5.80	4.40	6.03	3.97	2.00	2.63	2.07	2.43	2.30	4.49	2.52	3.12
17	5.53	3.65	5.55	3.73	2.00	2.50	2.05	2.33	2.37	4.22	5.70	2.97
18	5.10	3.13	5.45	3.47	2.00	2.45	2.10	2.30	2.50	7.55	6.89	2.85
19	4.60	3.27	5.13	3.23	2.00	2.35	2.17	2.27	2.45	7.89	5.45	2.79
20	4.15	3.57	4.75	3.07	1.95	2.30	2.15	2.27	2.45	6.55	4.25	2.62
21	4.30	3.75	4.50	2.90	1.95	2.53	2.23	2.45	2.35	5.47	3.67	4.37
22	6.53	3.53	5.60	2.77	1.95	3.77	2.25	2.65	2.27	4.82	3.35	5.39
23	6.63	3.55	7.57	2.70	1.95	4.45	3.50	2.40	2.20	4.25	3.29	4.97
24	5.63	3.25	12.11	2.65	1.87	5.03	4.65	2.30	2.23	4.02	3.39	4.25
25	4.80	3.20	11.48	2.60	1.85	4.43	3.43	2.25	2.20	3.92	3.32	4.05
26	4.53	3.15	9.20	2.57	1.85	3.97	2.80	2.70	2.15	3.67	3.05	3.79
27	4.23	2.95	7.15	2.50	1.87	3.40	2.60	4.13	2.10	3.52	2.87	3.72
28	4.20	6.80	6.07	2.45	1.90	2.95	2.45	3.57	2.10	3.45	2.79	3.45
29	5.35	------	5.70	2.40	1.90	3.03	2.35	10.63	2.10	3.45	2.85	3.57
30	9.68	------	5.30	2.35	1.87	3.65	2.47	10.53	2.07	3.42	2.85	3.65
31	10.23	------	6.20	------	1.85	------	2.70	8.57	------	3.35	------	3.75
1904.												
1	3.28	3.67	3.57	7.72	5.06	2.46	2.02	2.40	2.28	4.12	3.08	2.98
2	3.35	3.40	3.29	9.02	4.53	2.48	1.99	2.35	2.25	3.35	3.00	2.82
3	[a]3.42	3.59	3.92	------	4.08	2.38	2.14	2.98	2.28	2.90	2.92	2.85
4	3.88	3.67	6.65	6.95	3.68	2.36	2.14	2.95	2.28	2.80	2.88	2.70
5	3.52	3.55	8.48	6.20	3.51	2.38	2.06	2.60	2.20	2.68	2.82	2.85
6	3.58	3.15	7.68	6.15	3.33	2.41	2.09	3.52	2.22	2.62	2.80	2.68
7	3.30	4.42	7.52	6.35	3.13	2.46	2.04	3.40	2.28	2.62	2.92	2.68
8	3.28	10.49	11.40	6.98	2.98	2.57	2.04	2.72	2.22	2.52	2.90	2.60
9	3.15	11.92	13.62	7.14	2.86	3.67	2.04	2.50	2.22	2.45	2.80	2.60
10	3.20	10.85	12.25	8.74	2.80	4.23	2.04	2.38	2.20	2.42	2.75	2.68
11	3.10	8.62	9.80	8.24	2.69	3.43	2.04	2.50	2.18	2.40	2.75	2.58
12	2.98	7.15	8.02	6.94	2.65	2.93	1.99	2.45	2.18	2.88	2.75	2.98
13	2.78	6.09	6.88	6.09	2.65	2.65	2.04	2.30	2.20	5.60	2.70	2.50
14	2.72	5.27	6.08	5.51	2.49	2.50	2.02	2.22	2.15	4.68	2.70	2.58
15	2.85	4.77	5.30	4.97	2.59	2.43	1.95	2.20	3.00	3.65	2.68	2.58
16	3.05	6.12	4.75	4.61	3.22	2.45	1.92	2.28	3.10	3.45	2.70	2.58
17	2.85	[b]6.85	4.28	4.49	3.45	2.33	2.05	2.22	2.82	2.95	2.78	2.60
18	3.00	6.07	3.85	4.39	3.17	2.33	2.28	2.18	2.55	2.80	2.75	2.48
19	2.98	5.67	3.55	4.49	2.92	2.23	2.10	2.18	2.42	2.70	2.65	2.60
20	3.08	5.22	3.92	4.37	3.22	2.17	2.05	2.22	2.35	2.62	2.65	2.40
21	3.80	4.72	4.45	4.17	3.05	2.20	1.98	2.90	2.30	5.95	2.82	2.45
22	2.78	4.52	4.30	3.97	2.75	2.13	2.00	3.18	2.30	7.48	3.58	2.58
23	7.02	4.92	7.42	3.97	2.67	2.24	1.98	4.55	2.28	6.95	3.72	2.40
24	7.82	5.72	11.40	3.77	2.59	2.09	2.00	4.20	2.18	5.32	3.55	2.55
25	[c]8.27	5.52	12.12	3.79	2.62	2.06	2.02	3.38	3.52	4.40	3.38	3.08
26	6.85	4.67	15.92	3.96	2.52	2.02	2.02	2.92	3.25	4.40	3.32	3.15
27	5.95	4.19	15.70	3.93	2.49	1.99	2.05	2.78	3.22	4.35	3.18	3.40
28	5.25	3.75	12.62	5.83	2.45	1.99	2.52	------	2.85	3.92	2.90	8.80
29	4.42	3.67	8.50	6.36	2.36	2.04	2.58	2.48	2.65	3.65	2.78	9.60
30	4.27	------	6.90	5.63	2.36	1.99	3.12	2.38	2.80	3.42	2.88	7.05
31	3.89	------	6.72	------	2.36	------	2.65	2.35	------	3.18	------	5.25

[a] Anchor ice. January 6 river frozen nearly across.

[b] Heavy anchor ice. River frozen over 2,000 feet downstream from junction of the two rivers. Ice gorge causes backwater March 4—15.

[c] Current of stream very sluggish.

Rating table for Susquehanna River at Binghamton, N. Y., for 1901 to 1904, inclusive.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1.75	210	3.9	5,255	7.2	15,260	11.6	30,860
1.8	315	4.0	5,510	7.4	15,920	11.8	31,580
1.9	525	4.1	5,770	7.6	16,590	12.0	32,300
2.0	740	4.2	6,030	7.8	17,270	12.2	33,020
2.1	960	4.3	6,300	8.0	17,950	12.4	33,740
2.2	1,180	4.4	6,570	8.2	18,650	12.6	34,470
2.3	1,400	4.5	6,845	8.4	19,350	12.8	35,210
2.4	1,625	4.6	7,125	8.6	20,060	13.0	35,950
2.5	1,855	4.7	7,405	8.8	20,780	13.5	37,820
2.6	2,085	4.8	7,690	9.0	21,500	14.0	39,720
2.7	2,315	4.9	7,980	9.2	22,220	14.5	41,650
2.8	2,545	5.0	8,280	9.4	22,940	15.0	43,600
2.9	2,785	5.2	8,880	9.6	23,660	15.5	45,550
3.0	3,025	5.4	9,495	9.8	24,380	16.0	47,500
3.1	3,265	5.6	10,120	10.0	25,100	16.5	49,500
3.2	3,505	5.8	10,760	10.2	25,820	17.0	51,500
3.3	3,755	6.0	11,400	10.4	26,540	17.5	53,500
3.4	4,005	6.2	12,040	10.6	27,260	18.0	55,500
3.5	4,255	6.4	12,680	10.8	27,980	18.5	57,500
3.6	4,505	6.6	13,320	11.0	28,700	19.0	59,500
3.7	4,755	6.8	13,960	11.2	29,420	19.5	61,500
3.8	5,005	7.0	14,600	11.4	30,140	20.0	63,500

Mean daily discharge, in second-feet, of Susquehanna River at Binghamton, N. Y., 1901–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1								399	1,180	1,180	850	1,855
2								652	1,070	1,180	784	1,855
3								546	1,070	1,070	609	2,200
4								441	1,180	1,070	609	1,970
5								441	1,136	1,070	652	2,200
6								441	1,070	850	609	1,740
7								441	850	850	609	1,444
8								546	850	718	609	1,510
9								546	850	850	567	1,740
10								441	652	718	609	8,880
11								609	696	784	567	11,720
12								609	850	652	652	9,185
13								546	850	718	1,855	8,655
14								652	740	850	2,905	7,125
15								609	916	1,070	2,545	43,210
16								609	1,070	1,444	1,970	38,580
17								652	1,180	1,625	1,740	22,220
18								982	1,510	1,458	1,671	10,280
19								1,092	1,510	1,290	1,510	6,300
20								872	1,510	1,290	1,625	4,130
21								4,630	1,290	1,290	1,625	2,905
22								2,977	1,070	1,290	1,444	2,430

Mean daily discharge, in second-feet, of Susquehanna River at Binghamton, N. Y., 1901–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
23								2,085	850	1,290	1,400	4,880
24								6,845	850	1,180	2,315	7,265
25								5,130	850	1,070	4,055	5,380
26								3,505	850	960	2,905	3,805
27								2,499	740	850	1,901	3,630
28								1,740	762	850	1,290	2,665
29								1,570	784	850	1,510	2,785
30								1,290	850	850	1,625	4,755
31								1,400		850		5,640
1902.												
1	3,555	1,970	45,940	8,880	2,665	1,510	8,580	7,980	1,026	6,985	7,125	2,430
2	4,005	1,970	60,300	8,580	2,665	1,554	6,165	11,240	1,026	6,165	5,640	2,384
3	3,555	1,970	54,300	7,835	2,430	1,400	4,505	9,030	1,026	4,680	4,755	2,665
4	4,380	3,630	38,960	6,985	2,200	2,154	5,180	6,845	1,070	3,880	4,180	3,265
5	3,555	2,905	22,220	6,030	2,200	3,195	4,080	4,930	1,026	2,785	3,680	3,830
6	3,385	2,200	12,520	5,640	2,246	2,665	5,455	4,130	894	2,857	3,337	3,460
7	3,075	2,361	10,120	5,255	2,016	2,154	6,705	3,930	850	2,617	3,193	2,857
8	2,593	2,430	9,340	5,130	1,924	2,016	6,435	3,265	960	2,476	3,025	2,476
9	2,200	2,545	8,430	7,545	1,740	2,200	5,510	2,953	894	2,430	2,617	2,384
10	1,970	2,361	10,600	9,495	1,740	2,085	5,640	2,617	1,290	2,246	2,476	2,665
11	1,901	2,665	10,120	10,440	1,510	1,786	7,545	2,384	1,290	1,970	2,315	2,617
12	1,740	2,200	17,270	9,650	1,466	1,786	6,435	2,430	1,290	2,246	2,200	2,905
13	2,016	1,671	29,420	8,430	1,400	2,016	4,080	2,545	1,246	2,476	2,200	2,617
14	1,740	1,510	31,940	7,405	1,400	2,016	3,100	2,430	1,070	2,785	2,430	2,246
15	1,510	1,290	27,260	6,435	1,334	2,200	2,430	2,085	1,070	2,785	2,246	2,430
16	1,444	1,290	19,350	5,380	1,290	2,200	2,315	1,855	960	2,713	1,970	2,857
17	1,290	1,180	31,580	4,755	1,290	1,924	2,154	1,625	850	2,430	1,970	14,930
18	1,224	1,070	31,940	4,330	1,070	1,970	2,200	1,510	850	2,085	1,924	16,760
19	1,671	1,070	23,300	3,930	1,070	1,855	2,200	1,400	850	1,855	1,786	13,640
20	2,200	1,070	13,960	3,435	1,070	1,855	15,590	1,400	740	2,085	1,855	10,920
21	1,070	1,180	10,440	3,195	1,290	1,740	28,340	1,510	630	2,430	1,740	9,185
22	1,970	1,004	9,805	2,953	1,466	1,786	29,960	1,510	630	2,384	1,740	23,120
23	7,545	1,290	10,120	2,665	1,510	2,016	25,100	1,334	740	2,016	1,786	27,260
24	8,730	1,400	10,600	2,246	1,290	1,855	21,140	1,334	674	1,924	1,740	18,650
25	6,030	1,070	9,650	2,154	1,180	1,554	18,300	1,290	740	1,924	1,786	12,360
26	4,005	1,004	7,980	1,970	1,554	1,334	12,520	1,290	1,510	1,855	1,924	10,280
27	3,385	1,671	6,985	1,855	1,970	1,554	9,495	1,180	2,154	1,740	2,315	8,280
28	4,680	9,650	6,705	1,924	1,924	1,554	16,250	1,290	1,970	11,240	2,665	6,845
29	5,510		9,185	1,924	1,786	2,665	11,560	1,334	8,280	19,000	2,785	5,380
30	3,880		10,440	2,085	1,625	14,600	8,280	1,400	5,005	15,095	2,617	5,005
31	2,665		9,960		1,510		9,960	1,114		9,960		4,580
1903.												
1	4,005	20,060	35,580	13,480	1,466	420	3,880	1,970	13,160	894	3,630	2,131
2	3,755	15,260	27,980	10,920	1,334	462	3,025	1,694	8,730	1,026	3,193	2,315
3	4,755	15,260	17,100	8,730	1,290	420	2,384	1,400	6,300	1,070	2,905	2,200
4	8,730	19,000	11,880	8,430	1,290	315	2,016	1,290	4,755	960	2,665	2,200
5	9,340	23,660	10,280	7,690	1,246	378	1,740	1,855	3,535	1,026	2,665	2,131
6	7,265	17,780	12,840	6,435	1,180	315	1,510	3,435	3,535	1,290	3,145	1,786
7	5,080	12,520	12,360	5,900	1,114	252	1,334	3,630	3,535	1,510	3,435	1,901
8	4,880	8,280	12,520	8,130	1,070	420	1,290	3,097	2,315	2,315	2,953	1,901
9	4,130	7,265	27,800	10,280	1 070	315	1,180	2,545	2,246	17,950	2,665	2,016
10	11,560	6,435	27,080	8,430	960	315	1,114	2,154	1,970	45,550	2,430	1,400
11	9,960	6,030	30,680	7,405	850	315	1,026	2,384	2,200	48,900	2,361	1,740
12	11,240	9,650	30,500	6,570	850	2,476	960	2,617	2,246	32,660	2,246	1,970
13	11,400	14,440	23,660	5,640	850	9,340	960	2,315	2,085	18,650	2,131	2,200
14	11,560	11,560	17,100	4,830	850	4,130	894	2,085	1,855	11,400	2,085	3,435
15	10,920	8,130	13,480	5,640	850	3,097	1,026	1,970	1,556	8,580	1,901	3,555
16	10,760	6,570	11,560	5,430	740	2,154	894	1,697	1,400	6,845	1,901	3,313
17	9,960	4,630	9,960	4,830	740	1,855	850	1,466	1,556	6,030	10,440	2,953
18	8,580	3,340	9,650	4,180	740	1,740	960	1,400	1,855	16,420	14,280	2,665
19	7,125	3,680	8,730	3,580	740	1,510	1,114	1,334	1,740	17,610	9,650	2,545
20	5,900	4,430	7,545	3,193	630	1,400	1,070	1,334	1,740	13,160	6,165	2,131
21	6,300	4,880	6,845	2,785	630	1,924	1,246	1,740	1,510	9,650	4,680	6,435
22	13,160	4,330	10,120	2,476	630	4,930	1,290	2,200	1,334	7,690	3,880	9,495
23	13,480	4,380	16,590	2,315	630	6,705	4,255	1,625	1,180	6,165	3,755	8,130
24	10,280	3,630	32,660	2,200	462	8,430	7,265	1,400	1,246	5,510	4,005	6,165
25	7,690	3,505	30,500	2,085	420	6,705	4,080	1,290	1,180	5,305	3,805	5,640
26	6,985	3,385	22,220	2,016	420	5,430	2,545	2,315	1,070	4,680	3,145	5,005
27	6,165	2,905	15,095	1,855	462	4,005	2,085	5,900	960	4,305	2,713	4,805
28	6,030	13,960	11,560	1,740	525	2,905	1,740	4,430	960	4,130	2,545	4,130
29	9,340		10,440	1,625	525	3,097	1,510	27,260	960	4,130	2,665	4,430
30	24,020		9,185	1,510	462	4,630	1,786	26,900	894	4,055	2,665	4,630
31	25,820		12,040		420		2,315	20,060		3,880		4,880

Mean daily discharge, in second-feet, of Susquehanna River at Binghamton, N. Y., 1901–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
1	3,705	4,680	4,430	16,930	8,430	1,763	784	1,625	1,356	5,770	3,217	2,977
2	3,880	4,005	3,730	21,500	6,985	1,809	718	1,510	1,290	3,880	3,025	2,593
3	4.055	4,480	5,305	17,950	5,770	1,579	1,048	2,977	1,356	2,785	2,833	2,665
4	5,205	4,680	6,740	14,440	4,705	1,532	1,048	2,905	1,356	2,545	2,737	2,315
5	4,305	4,380	9,815	12,040	4,280	1,579	872	2,085	1,180	2,269	2,593	2,665
6	4,455	3,385	8,410	11,880	3,830	1,648	938	4,305	1,224	2,131	2,545	2,269
7	3,755	6,624	10,100	12,520	3,337	1,763	828	4,005	1,356	2,131	2,833	2,269
8	3,705	26,864	15,070	14,600	2,977	2,016	828	2,361	1,224	1,901	2,785	2,085
9	3,385	32,012	19,100	15,095	2,689	4,680	828	1,855	1,224	1,740	2,545	2,085
10	3,505	28,160	16,600	20,600	2,545	6,165	828	1,579	1,180	1,671	2,430	2,269
11	3,265	20,132	12,190	18,825	2,292	4,080	828	1,855	1,136	1,625	2,430	2,039
12	2,977	15,095	8,970	14,440	2,200	2,857	718	1,740	1,136	2,737	2,430	2,977
13	2,499	11,688	7,140	11,720	2,200	2,200	828	1,400	1,180	10,120	2,315	1,855
14	2,361	9,092	5,860	9,805	1,832	1,855	784	1,224	1,070	7,405	2.315	2,039
15	2,665	7,603	5,000	8,130	2,062	1,694	630	1,180	3,025	4,630	2,269	2,039
16	3,145	11,784	7,545	7,125	3,555	1,740	567	1,356	3,265	4,130	2,315	2,039
17	2,665	14,120	6,300	6,845	4,130	1,466	850	1,224	2,593	2,905	2,499	2,085
18	3,025	11,624	5,130	6,570	3,433	1,466	1,356	1,136	1,970	2,545	2,430	1,809
19	2,977	10,344	4,380	6,845	2,833	1,246	960	1,136	1,671	2,315	2,200	2,085
20	3,217	8,940	5,305	6,435	3,555	1,114	850	1,224	1,510	2,131	2,200	1,625
21	5,005	7,461	6,705	5,900	3,145	1,180	696	2,785	1,400	11,240	2,593	1,740
22	2,499	6,901	6,300	5,432	2,430	1,026	740	3,457	1,400	16,250	4,455	2,039
23	14,666	8,040	15,920	5,432	2,246	1,048	696	6,985	1,356	14,440	4,805	1,625
24	17,338	10,504	30,140	4,930	2,062	938	740	6,030	1,136	9,185	4,380	1,970
25	18,895	9,867	32,660	4,980	2,131	872	784	3,955	4,305	6,570	3,955	3,217
26	14,120	7,321	47,110	5,406	1,901	784	784	2,833	3,630	6,570	3,805	3,385
27	11,240	6,004	46,330	5,330	1,832	718	850	2,499	3,555	6,435	3,457	4,005
28	9,030	4,880	34,470	5,080	1,740	718	1,901	2,154	2,665	5,305	2,785	20,780
29	6,624	4,680	19,700	12,520	1,532	828	2,039	1,809	2,200	4,630	2,499	23,660
30	6,219		14,280	10,280	1,532	718	3,313	1,579	2,545	4,055	2,737	14,765
31	5,230		13,640		1,532		2,200	1,510		3,457		9,034

Estimated monthly discharge of Susquehanna River at Binghamton, N. Y., 1901–1904.

[Drainage area, 2,400 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1901.					
August	6,845	399	1,475	0.61	0.70
September	1,510	652	988	.41	.46
October	1,625	652	1,034	.43	.50
November	4,055	567	1,454	.61	.68
December	43,210	1,444	7,514	3.13	3.61
1902.					
January	8,730	1,070	3,177	1.32	1.52
February	9,650	1,004	2,058	.86	.89
March	60,300	6,705	19,701	8.21	9.48
April	10,440	1,855	5,285	2.20	2.45
May	2,665	1,070	1,672	.70	.81
June	14,600	1,334	2,373	.99	1.10
July	29,960	2,154	9,587	4.00	4.61
August	11,240	1,114	2,941	1.23	1.42
September	8,280	630	1,420	.59	.66

Estimated monthly discharge of Susquehanna River at Binghamton, N. Y., 1901–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1902.					
October	19,000	1,740	4,197	1.75	2.02
November	7,125	1,740	2,734	1.14	1.27
December	27,260	2,246	7,461	3.11	3.59
The year	60,300	630	5,217	2.18	29.82
1903.					
January	25,820	3,755	9,360	3.90	4.50
February	23,660	2,905	9,248	3.85	4.01
March	35,580	6,845	17,275	7.19	8.29
April	13,480	1,510	5,344	2.23	2.49
May	1,466	420	821	.34	.39
June	9,340	252	2,680	1.12	1.25
July	7,265	850	1,914	.80	.92
August	27,260	1,290	4,413	1.84	2.12
September	13,160	894	2,654	1.11	1.24
October	48,900	894	10,108	4.21	4.85
November	14,280	1,901	3,890	1.62	1.81
December	9,495	1,400	3,556	1.48	1.71
The year	48,900	252	5,930	2.47	33.58
1904.					
January	18,895	2,361	5,794	2.41	2.78
February	32,012	3,385	10,530	4.39	4.73
March	47,110	3,730	14,010	5.84	6.73
April	21,500	4,930	10,650	4.44	4.95
May	8,430	1,532	3,088	1.29	1.49
June	6,165	718	1,769	.737	.822
July	3,313	567	1,027	.428	.493
August	6,985	1,136	2,396	.998	1.151
September	4,305	1,070	1,850	.770	.859
October	16,250	1,625	5,016	2.09	2.41
November	4,805	2,200	2,881	1.20	1.34
December	23,660	1,625	4,226	1.76	2.03
The year	47,110	567	5,270	2.20	29.78

CHENANGO RIVER AT BINGHAMTON, N. Y.

This station was established by R. E. Horton July 31, 1901. The gage is located on the upstream side of the first span from the right bank of Court Street Bridge, Binghamton. It is a boxed wire gage secured to the vertical supports of the hand railing. The bench mark is a circular chisel draft on the upstream corner of the bridge seat on the left abutment. Its elevation is 34.02 feet above gage datum. Court Street Bridge stands squarely across the stream, which has a nearly horizontal bed of gravel and small cobblestones, affording a smooth, uniform current for gaging. The channel is obstructed by three masonry piers supporting the four spans of the bridge, 79 feet clear width each, the bridge having a total length of 337 feet between abutments. The bridge is situated 2,500 feet above the confluence of Chenango and Susquehanna rivers. A small rift below the bridge cuts off backwater from the Susquehanna at ordinary stages of the rivers. For periods during freshets or at times when there is an abnormal rise on one stream, accompanied by a similar rise in the other stream, either the Chenango or Susquehanna River record at Binghamton may be affected by backwater, indicating a too great discharge. For freshets of considerable duration the flow of the two streams will be more nearly equalized. Gage readings on Chenango River, as well as those on Susquehanna River at Binghamton, are taken by E. F. Weeks. In estimating run-off of Chenango River the area directly tributary to storage reservoirs from which diversion is made to supply Erie Canal has been deducted from the total area naturally tributary to Chenango River.

In estimating the run-off of Chenango River the area directly tributary to storage reservoirs, from which diversion is made to supply Erie Canal, has been deducted from the total area naturally tributary to Chenango River, as follows:

		Square miles.
Natural tributary area [a]		1,580
Diversion area, 6 reservoirs at head of Chenango River, whose overflow is turned into Erie Canal through Oriskany Creek	30	
Diversion area, De Ruyter reservoir, at head of Tioughnioga River; outflow turned into Erie Canal through Limestone Creek	18	
		48
Net area used for Chenango basin		1,532

Above estimate of diversion area is approximate. No allowance for direct inflow to feeder channels from additional areas nor for waste into original stream. Gross area, from which more or less run-off is diverted, is about 105 square miles.

[a] From Bien's Atlas of New York State. Areas tributary to reservoirs are from New York Barge Canal Report, 1900.

Discharge measurements of Chenango River at Binghamton, N. Y., 1901–1904.

Date.	Hydrographer.	Area.	Mean velocity.	Gage height.	Discharge.
1901.		*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
July 2	E. C. Murphy	689	1.23	5.64	848
July 8	do	764	1.46	5.78	1,119
July 9	do	617	1.53	5.71	942
July 29	do	602	.61	5.21	405
Do	do	469	.90	5.21	425
August 19	do	547	1.04	5.48	566
Do	do	681	.85	5.49	577
October 19	do	646	1.53	5.81	987
Do	do	775	1.20	5.82	927
1902.					
March 27	E. C. Murphy	1,384	3.04	8.15	4,201
March 28	do	1,489	2.94	8.21	4,377
March 29	do	1,590	3.27	8.75	5,205
June 6 [a]	R. E. Horton	956	2.52	7.00	2,407
July 1	E. C. Murphy	1,534	3.14	8.49	4,815
July 3	do	1,155	2.33	7.24	2,688
July 15	do	995	2.13	6.64	2,098
August 3	do	1,775	3.12	9.16	5,543
August 14	do	877	1.83	6.32	1,605
August 15	do	841	1.48	6.20	1,341
September 3	C. C. Covert	675	.80	5.56	546
1903.					
April 6	E. C. Murphy	1,359	2.71	7.72	3,695
May 15	do	646	.83	5.49	538
June 13	C. C. Covert	1,490	1.93	8.06	2,877
August 19	J. C. Hoyt	621	.97	5.62	601
August 21	C. C. Covert	1,006	2.23	6.72	2,243
October 1	H. H. Halsey	650	1.09	5.51	709
October 10	C. C. Covert	5,411	5.23	19.81	28,300
1904.					
March 8	C. C. Covert	3,702	3.45	[b] 14.90	9,104
April 8	R. E. Horton	2,459	5.42	10.86	11,632
July 12	C. C. Covert	595	.87	5.42	516
September 10	do	467	1.15	5.55	539
November 22	H. R. Beebe	1,022	2.45	6.86	2,505

[a] Rough measurement. [b] Backwater, caused by ice jam.

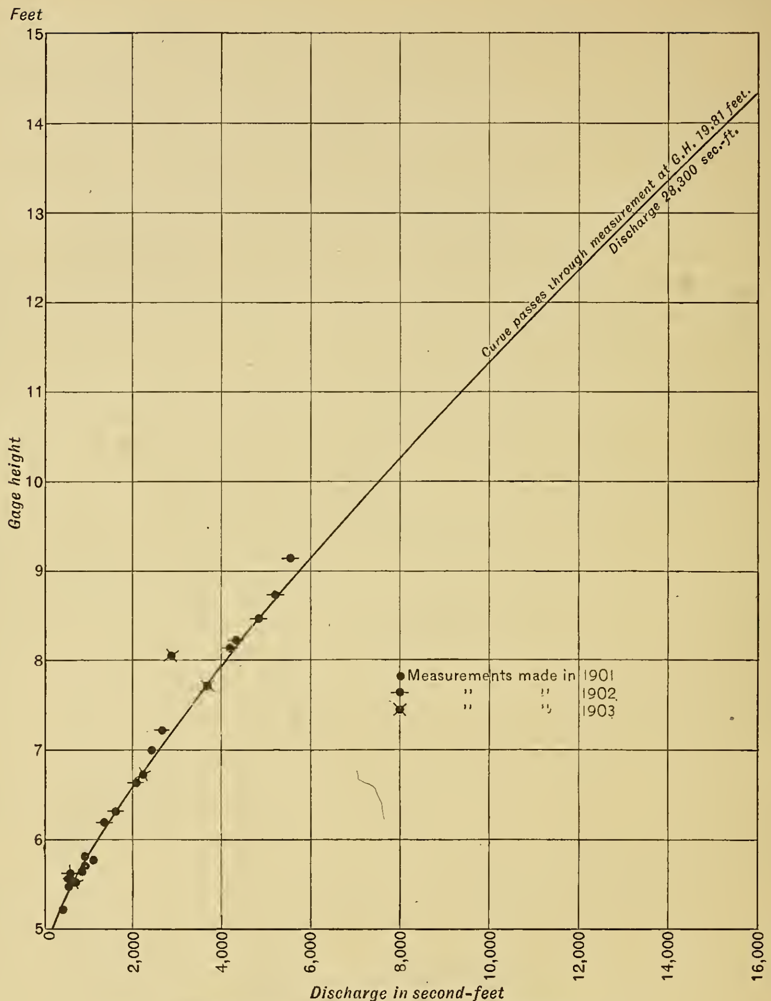


FIG. 3.—Rating curve for Chenango River at Binghamton, N. Y.

Mean daily gage height, in feet, of Chenango River at Binghamton, N. Y., 1901–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1								5.18	5.58	5.70	5.46	6.12
2								5.12	5.75	5.50	5.30	6.33
3								5.10	5.58	5.51	5.25	6.60
4								5.10	5.50	5.68	5.28	6.52
5								5.05	5.42	5.54	5.26	6.19
6								5.20	5.28	5.50	5.25	5.95
7								5.05	5.22	5.46	5.25	5.90
8								5.10	5.20	5.47	5.22	6.02
9								5.20	5.18	5.40	5.23	6.08
10								5.20	5.15	5.37	5.21	8.14
11								5.22	5.15	5.34	5.13	10.00
12								5.20	5.18	5.33	5.26	8.82
13								5.18	5.30	5.42	6.85	
14								5.12	5.48	6.47	6.46	8.48
15								5.15	5.35	6.40	6.19	19.54
16								6.35	5.42	6.08	6.11	17.67
17								5.90	5.55	5.89	6.10	12.61
18								5.60	5.62	5.85	6.06	9.41
19								5.48	5.55	5.80	6.06	8.11
20								5.40	5.45	5.82	6.00	7.39
21								5.55	5.45	5.78	5.95	6.84
22								5.58	5.30	5.75	5.95	6.66
23								5.48	5.22	5.70	5.94	7.26
24								6.70	5.20	5.66	6.71	8.18
25								6.20	5.25	5.57	7.78	7.41
26								5.65	5.24	5.48	7.18	6.88
27								5.38	5.25	5.45	6.63	6.83
28								5.30		5.39	6.05	6.50
29								5.25	5.15	5.40	6.20	6.52
30								5.20	5.88	5.35	6.32	7.20
31								5.20		5.39		7.36
1902.												
1	6.62	6.31	18.75	8.65	6.54	6.25	8.58	8.46	5.58	7.28	8.04	6.54
2	6.64	6.25	22.75	8.61	6.32	6.13	7.88	9.46	5.54	7.26	7.56	6.48
3	6.74	6.13	21.65	8.45	6.22	6.00	7.39	8.47	5.56	6.68	7.26	6.68
4	6.91	6.34	17.35	8.10	6.22	6.27	7.43	7.82	5.48	6.28	6.98	7.24
5	6.64	6.20	12.80	7.82	6.22	7.00	7.13	7.32	5.46	6.04	6.84	7.14
6	6.61	6.19	9.98		6.12	6.63	7.46	7.00	5.44	6.28	6.74	6.74
7	6.52	6.16	9.25	7.60	6.12	6.35	8.20	7.02	5.48	6.56	6.71	6.61
8	6.30	6.20	9.02	7.58	6.12	6.35	8.00	6.87	5.46	6.44	7.58	6.51
9	6.22	6.21	8.68	8.12	6.12	6.37	7.80	6.80	5.48	6.46	6.44	6.26
10	6.12	6.08	9.45	8.50	6.00	6.35	7.88	6.57	5.86	6.31	6.34	6.18
11	6.14	6.10	9.28	8.98	5.97	6.20	9.23	6.52	6.08	6.14	6.28	6.56
12	6.02	5.98	11.60	8.78	5.92	6.37	8.40	6.77	5.81	6.16	6.24	6.54
13	5.87	5.90	15.08	8.48	5.87	6.30	7.40	6.72	5.66	6.16	6.48	6.24
14	5.88	5.84	15.78	8.22	5.82	6.35	6.96	6.40	5.61	6.36	6.41	6.01
15	5.89	5.77	14.18	7.80	5.77	6.25	6.68	6.24	5.56	6.64	6.31	6.11
16	5.91	5.86	11.98	7.42	5.72	6.23	6.56	6.22	5.46	6.31	6.16	6.04
17	5.88	5.76	15.86	7.18	5.74	6.25	6.56	6.10	5.41	6.11	6.11	10.53
18	5.76	5.78	15.72	7.05	5.72	6.15	6.48	6.04	5.36	6.01	6.08	10.94
19	5.78	5.74	13.10	6.90	5.62	6.05	6.80	6.00	5.36	5.96	6.06	9.91
20	5.78	5.71	10.48	6.80	5.77	6.05	11.36	6.00	5.31	6.81	6.11	9.08
21	5.66	5.64	9.40	6.72	6.05	6.03	15.02	5.71	5.28	6.86	6.06	8.51
22	6.02	5.67	9.20	6.64	5.93	6.28	15.02	6.00	5.26	6.51	6.08	12.84
23	8.24	5.68	9.32	6.52	5.83	6.33	13.52	5.91	5.31	6.34	6.08	14.03
24	8.66	5.66	9.38	6.40	5.77	6.16	12.34	5.88	5.28	6.31	6.16	11.28
25	7.62	5.68	8.95	6.32	6.00	6.00	11.47	5.84	5.31	6.31	6.21	9.31
26	6.86	5.73	8.48	6.20	6.35	6.06	9.62	5.81	5.54	6.21	6.28	8.71
27	6.86	6.08	8.15	6.20	6.63	6.18	8.62	5.71	5.76	6.16	6.78	8.24
28	7.28	8.92	8.15	6.14	6.35	6.16	11.62	5.78	5.66	9.30	7.06	7.64
29	7.39		8.95	6.14	6.25	6.73	9.70	5.74	7.64	11.71	6.78	7.24
30	6.85		9.28	6.30	6.23	10.56	8.62	5.74	6.44	10.41	6.61	7.28
31	6.40		8.98		6.20		9.30	5.66		8.96		6.98

Mean daily gage height, in feet, of Chenango River at Binghamton, N. Y., 1901–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	6.76	12.04	16.49	10.14	5.81	5.06	6.59	5.57	10.01	5.51	6.88	6.22
2	6.64	10.61	14.34	9.14	5.76	5.11	6.42	5.52	8.66	5.56	6.72	6.08
3	7.21	10.56	11.18	8.56	5.74	5.11	6.12	5.45	7.83	5.81	6.68	6.20
4	8.78	11.94	9.71	8.51	5.71	5.06	5.97	5.45	7.29	5.83	6.55	6.20
5	8.64	13.38	9.06	8.24	5.68	5.06	5.89	6.57	6.96	5.83	6.50	6.15
6	7.96	11.46	10.14	7.78	5.64	5.06	5.82	6.49	6.66	7.33	6.92	6.12
7	7.34	9.81	10.01	7.66	5.61	4.94	5.85	6.47	6.46	6.71	6.82	6.08
8	7.24	8.54	10.08	8.76	5.58	5.24	5.77	6.32	6.31	6.66	6.58	6.05
9	6.98	8.16	14.68	9.11	5.56	5.11	5.67	5.99	6.19	11.94	6.48	6.05
10	9.56	7.84	14.28	8.54	5.56	5.06	5.57	6.22	6.13	19.06	6.40	5.90
11	9.34	7.76	15.26	8.18	5.56	5.11	5.47	6.52	6.36	19.91	6.40	5.90
12	9.36	9.01	15.24	7.81	5.51	5.71	5.47	6.27	6.49	15.48	6.32	6.00
13	9.26	10.24	13.16	7.51	5.51	7.97	5.42	6.27	6.19	11.42	6.25	6.30
14	9.08	9.28	11.31	7.26	5.48	6.62	5.42	6.07	6.03	9.45	6.22	6.35
15	9.14	8.21	10.26	7.48	5.46	6.29	5.42	5.95	5.93	8.58	6.15	6.15
16	9.14	7.84	9.56	7.41	5.46	6.12	5.49	5.79	5.89	7.95	6.15	6.10
17	8.96	7.24	9.08	7.21	5.46	5.92	5.57	5.69	5.86	7.78	9.03	6.10
18	8.54	6.44	9.14	6.98	5.41	5.72	5.49	5.69	6.21	11.55	10.10	6.05
19	7.86	6.68	8.78	6.76	5.38	5.75	5.72	5.59	6.23	11.72	8.50	5.92
20	7.38	6.71	8.36	6.56	5.36	5.82	5.89	7.07	5.99	10.20	7.42	5.98
21	7.74	6.88	8.16	6.44	5.36	6.62	5.79	6.86	5.89	9.08	6.92	7.35
22	9.84	6.81	9.48	6.36	5.34	8.67	5.87	6.29	5.81	8.40	6.75	8.35
23	9.86	6.91	11.38	6.31	5.26	8.19	6.67	5.99	5.71	7.88	6.72	8.10
24	8.71	6.76	15.73	6.24	5.26	8.99	7.15	5.79	5.69	7.72	6.85	7.48
25	7.98	6.68	14.96	6.11	5.26	8.32	6.09	5.79	5.66	7.55	6.78	7.35
26	7.96	6.64	12.56	6.11	5.21	7.87	5.77	7.63	5.61	7.25	6.40	7.18
27	7.66	6.56	10.54	6.04	5.21	7.27	5.65	7.59	5.56	7.15	6.32	6.92
28	7.71	9.96	9.54	5.96	5.21	6.77	5.57	6.89	5.61	7.10	6.38	6.48
29	8.74	......	9.16	5.88	5.24	6.69	5.57	14.61	5.59	7.20	6.18	6.48
30	13.31	......	8.61	5.86	5.21	6.89	5.65	14.36	5.59	7.18	6.20	6.50
31	13.74	......	9.78	......	5.16	......	5.59	12.11	......	7.10	......	6.45
1904.												
1	6.42	7.32	7.60	11.30	8.72	7.14	5.59	6.10	5.70	7.69	6.22	6.15
2	6.55	7.20	7.40	12.90	8.19	6.79	5.73	7.08	5.72	6.85	6.20	5.95
3	6.42	7.18	7.88	[a]11.70	7.79	6.56	5.63	7.35	5.70	6.41	6.12	5.80
4	6.45	7.20	10.38	10.50	7.42	6.42	5.61	6.88	5.72	6.21	6.07	5.75
5	6.68	7.05	11.92	9.45	7.19	6.64	5.51	6.32	5.65	6.11	6.04	5.65
6	6.82	6.75	11.08	10.08	6.99	6.59	5.49	6.72	5.65	6.01	6.17	5.72
7	6.68	8.12	10.95	10.30	6.82	6.34	5.51	6.65	5.60	6.01	6.23	5.80
8	6.60	13.92	14.78	10.88	6.67	6.25	5.58	6.28	5.52	5.96	6.16	5.75
9	6.58	15.30	16.90	11.01	6.55	6.88	5.48	6.10	5.50	5.88	6.11	5.62
10	6.48	14.28	15.65	12.97	6.44	7.98	5.40	6.02	5.50	5.80	6.11	5.55
11	6.38	12.05	13.70	12.42	6.34	6.93	5.30	5.98	5.40	6.05	6.06	5.58
12	6.30	10.60	11.40	10.84	6.26	6.48	5.50	5.92	5.31	7.60	6.06	5.62
13	6.25	9.50	10.30	9.91	6.18	6.25	5.55	5.85	5.31	8.95	6.01	5.70
14	6.20	8.70	9.52	9.29	6.14	6.15	5.35	5.75	5.34	7.85	6.02	5.55
15	6.15	8.20	8.75	8.74	6.26	6.08	5.40	5.72	6.09	7.03	5.95	5.65
16	6.15	9.38	8.20	8.49	7.36	6.53	5.60	5.65	5.91	6.40	6.08	5.65
17	6.12	10.18	7.65	8.39	7.36	6.11	5.65	5.70	5.67	6.42	6.10	5.65
18	6.15	10.05	7.42	8.39	6.84	5.94	6.68	5.62	5.54	6.26	5.95	5.65
19	6.30	9.52	7.22	8.40	6.64	5.84	6.55	5.55	5.40	6.16	5.92	5.60
20	6.45	8.98	7.48	8.23	7.30	5.84	6.08	5.78	5.36	6.12	5.90	5.60
21	6.30	8.62	7.88	7.98	7.10	5.84	5.88	6.82	5.46	5.79	6.08	5.60
22	6.30	8.35	7.78	7.98	6.70	5.82	5.82	6.50	5.68	10.79	6.80	5.60
23	10.36	8.62	11.30	8.00	6.47	5.72	5.65	8.25	5.66	9.76	6.68	5.65
24	11.18	9.35	15.15	7.93	6.73	5.60	6.10	7.55	5.56	8.15	6.50	5.92
25	11.60	9.38	15.90	8.13	6.47	5.54	6.02	6.65	6.70	7.38	6.38	6.50
26	10.20	8.70	19.82	8.43	6.40	5.54	5.92	6.32	6.42	7.41	6.32	6.25
27	9.35	8.25	19.90	8.13	6.50	5.47	6.20	6.20	6.29	7.23	6.18	6.72
28	8.65	7.95	16.15	10.13	6.50	5.46	6.22	[a]6.05	6.15	6.92	5.98	12.75
29	8.10	7.88	12.08	10.19	6.40	5.46	6.65	5.90	5.95	6.68	5.80	13.28
30	7.88	......	10.62	9.39	6.26	5.49	6.90	5.80	6.92	6.53	6.20	10.15
31	7.60	......	10.58	......	6.76	......	6.32	5.72	......	6.32	......	5.25

[a] Interpolated.

Rating table for Chenango River at Binghamton, N. Y., for 1901 to 1904, inclusive.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
5.0	160	7.4	3,200	10.6	8,590	15.4	18,240
5.1	256	7.5	3,350	10.8	8,970	15.6	18,660
5.2	352	7.6	3,500	11.0	9,350	15.8	19,080
5.3	450	7.7	3,650	11.2	9,730	16.0	19,500
5.4	550	7.8	3,800	11.4	10,110	16.2	19,940
5.5	650	7.9	3,950	11.6	10,490	16.4	20,380
5.6	760	8.0	4,100	11.8	10,870	16.6	20,820
5.7	875	8.1	4,250	12.0	11,250	16.8	21,260
5.8	995	8.2	4,400	12.2	11,650	17.0	21,700
5.9	1,115	8.3	4,550	12.4	12,050	17.2	22,140
6.0	1,235	8.4	4,700	12.6	12,450	17.4	22,580
6.1	1,365	8.5	4,850	12.8	12,850	17.6	23,030
6.2	1,495	8.6	5,020	13.0	13,250	17.8	23,490
6.3	1,625	8.7	5,190	13.2	13,650	18.0	23,950
6.4	1,755	8.8	5,360	13.4	14,050	18.2	24,410
6.5	1,885	8.9	5,530	13.6	14,460	18.4	24,870
6.6	2,025	9.0	5,700	13.8	14,880	18.6	25,340
6.7	2,165	9.2	6,060	14.0	15,300	18.8	25,820
6.8	2,305	9.4	6,420	14.2	15,720	19.0	26,300
6.9	2,450	9.6	6,780	14.4	16,140	19.2	26,780
7.0	2,600	9.8	7,140	14.6	16,560	19.4	27,260
7.1	2,750	10.0	7,500	14.8	16,980	19.6	27,760
7.2	2,900	10.2	7,860	15.0	17,400	19.8	28,280
7.3	3,050	10.4	8,220	15.2	17,820		

Remarks: Tangent at 19.5 feet. Differences above this point 260 per tenth.

Mean daily discharge, in second-feet, of Chenango River at Binghamton, N. Y., 1901–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	......	......	......	......	......	......	......	333	738	875	610	1,391
2	......	......	......	......	......	......	......	275	935	650	450	1,664
3	......	......	......	......	......	......	......	256	738	661	400	2,025
4	......	......	......	......	......	......	......	256	650	851	430	1,913
5	......	......	......	......	......	......	......	208	570	694	410	1,482
6	......	......	......	......	......	......	......	352	430	650	400	1,175
7	......	......	......	......	......	......	......	208	371	610	400	1,115
8	......	......	......	......	......	......	......	256	352	620	371	1,261
9	......	......	......	......	......	......	......	352	333	550	381	1,339
10	......	......	......	......	......	......	......	352	304	520	361	4,325
11	......	......	......	......	......	......	......	371	304	490	285	7,500
12	......	......	......	......	......	......	......	352	333	480	410	5,360
13	......	......	......	......	......	......	......	333	450	570	2,375	5,105
14	......	......	......	......	......	......	......	275	630	1,846	1,833	4,850
15	......	......	......	......	......	......	......	304	500	1,755	1,482	27,630
16	......	......	......	......	......	......	......	1,690	570	1,339	1,378	23,145
17	......	......	......	......	......	......	......	1,115	705	1,102	1,365	12,450
18	......	......	......	......	......	......	......	760	782	1,055	1,313	6,420
19	......	......	......	......	......	......	......	630	705	995	1,313	4,250
20	......	......	......	......	......	......	......	550	600	1,019	1,235	3,200
21	......	......	......	......	......	......	......	705	600	971	1,175	2,361
22	......	......	......	......	......	......	......	738	450	935	1,175	2,109
23	......	......	......	......	......	......	......	630	371	875	1,163	2,975
24	......	......	......	......	......	......	......	2,165	352	827	2,180	4,400
25	......	......	......	......	......	......	......	1,495	400	727	3,800	3,200
26	......	......	......	......	......	......	......	815	391	630	2,900	2,420
27	......	......	......	......	......	......	......	530	400	600	2,067	2,347
28	......	......	......	......	......	......	......	450	352	540	1,300	1,885
29	......	......	......	......	......	......	......	400	304	550	1,495	1,913
30	......	......	......	......	......	......	......	352	1,091	500	1,651	2,900
31	......	......	......	......	......	......	......	352	......	540	......	3,125
1902.												
1	2,053	1,638	25,700	5,105	1,941	1,560	5,020	4,775	738	3,050	4,175	1,941
2	2,081	1,560	35,950	5,020	1,651	1,404	3,950	6,510	694	2,975	3,425	1,859
3	2,221	1,404	33,090	4,775	1,521	1,235	3,200	4,775	716	2,137	2,975	2,137
4	2,465	1,677	22,470	4,250	1,521	1,586	3,275	3,800	630	1,599	2,570	2,975
5	2,081	1,495	12,850	3,800	1,521	2,600	2,825	3,050	610	1,287	2,361	2,825
6	2,039	1,482	7,500	3,650	1,391	2,067	3,275	2,600	590	1,599	2,221	2,221
7	1,913	1,443	6,150	3,500	1,391	1,690	4,400	2,630	630	1,969	2,179	2,039
8	1,625	1,495	5,700	3,500	1,391	1,690	4,100	2,405	610	1,807	3,500	1,899
9	1,521	1,508	5,190	4,250	1,391	1,716	3,800	2,305	630	1,833	1,807	1,573
10	1,391	1,339	6,510	4,850	1,235	1,690	3,950	1,983	1,067	1,638	1,677	1,469
11	1,417	1,365	6,240	5,700	1,199	1,495	6,150	1,913	1,339	1,417	1,599	1,969
12	1,261	1,211	10,490	5,360	1,139	1,716	4,700	2,263	1,007	1,443	1,547	1,941
13	1,079	1,115	17,610	4,850	1,079	1,625	3,200	2,193	827	1,443	1,859	1,547
14	1,091	1,043	19,080	4,400	1,019	1,690	2,540	1,755	771	1,703	1,768	1,248
15	1,103	959	15,720	3,800	959	1,560	2,137	1,547	716	2,081	1,638	1,378
16	1,127	1,067	11,250	3,200	899	1,534	1,969	1,521	610	1,638	1,443	1,287
17	1,091	947	19,185	2,900	923	1,560	1,969	1,365	560	1,378	1,378	8,495
18	947	971	18,870	2,675	899	1,430	1,859	1,287	510	1,248	1,339	9,255
19	971	923	13,450	2,450	782	1,300	2,305	1,235	510	1,187	1,313	7,320
20	971	887	8,400	2,305	959	1,300	10,015	1,235	460	2,319	1,378	5,880
21	827	804	6,420	2,193	1,300	1,274	17,400	887	430	2,390	1,313	4,850
22	1,261	839	6,060	2,081	1,151	1,599	17,400	1,235	410	1,899	1,339	12,950
23	4,475	851	6,240	1,913	1,031	1,664	14,250	1,127	460	1,677	1,339	15,405
24	5,105	827	6,420	1,755	959	1,443	11,950	1,091	430	1,638	1,443	9,920
25	3,500	851	5,615	1,651	1,235	1,235	10,205	1,043	460	1,638	1,508	6,240
26	2,390	911	4,850	1,495	1,690	1,313	6,780	1,007	694	1,508	1,599	5,190
27	2,390	1,339	4,325	1,495	2,067	1,469	5,020	887	947	1,443	2,277	4,475
28	3,050	5,530	4,325	1,417	1,690	1,443	10,490	971	827	6,240	2,675	3,575
29	3,200	......	5,615	1,417	1,560	2,207	6,960	923	3,575	10,680	2,277	2,975
30	2,375	......	6,240	1,625	1,534	8,495	5,020	923	1,807	8,220	2,039	3,050
31	1,755	......	5,700	......	1,495	......	6,240	827	......	5,615	......	2,570

Mean daily discharge, in second-feet, of Chenango River at Binghamton, N. Y., 1901–1904—Continued.

Days.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	2,249	11,350	20,600	7,770	1,007	217	2,011	727	7,500	661	2,420	1,521
2	2,081	8,590	16,035	5,970	947	265	1,781	672	5,105	716	2,193	1,339
3	2,900	8,495	9,730	4,935	923	265	1,391	600	3,875	1,007	2,137	1,495
4	5,360	11,155	6,960	4,850	887	217	1,199	600	3,050	1,031	1,955	1,495
5	5,105	14,050	5,790	4,475	851	217	1,103	1,983	2,540	1,031	1,885	1,430
6	4,025	10,205	7,770	3,800	804	217	1,019	1,872	2,109	3,125	2,480	1,391
7	3,125	7,140	7,500	3,575	771	103	1,055	1,846	1,833	2,179	2,333	1,339
8	2,975	4,935	7,680	5,275	738	390	959	1,651	1,638	2,109	1,997	1,300
9	2,570	4,325	16,770	5,880	716	265	839	1,223	1,482	11,155	1,859	1,300
10	6,690	3,875	15,930	4,935	716	217	727	1,521	1,404	26,420	1,755	1,115
11	6,330	3,725	17,925	4,400	716	265	620	1,913	1,703	28,540	1,755	1,115
12	6,330	5,700	17,925	3,800	661	887	620	1,586	1,872	18,450	1,651	1,235
13	6,150	7,950	13,550	3,350	661	4,025	570	1,586	1,482	10,110	1,560	1,625
14	5,880	6,240	9,920	2,975	630	2,053	570	1,326	1,274	6,510	1,521	1,690
15	5,970	4,400	7,950	3,350	610	1,612	570	1,175	1,151	5,020	1,430	1,430
16	5,970	3,875	6,690	3,200	610	1,391	640	983	1,103	4,025	1,430	1,365
17	5,615	2,975	5,880	2,900	610	1,139	727	863	1,067	3,800	5,790	1,365
18	4,935	1,807	5,970	2,570	560	899	640	863	1,508	10,395	7,680	1,300
19	3,875	2,137	5,360	2,249	530	935	899	749	1,534	10,680	4,850	1,139
20	3,200	2,179	4,625	1,969	510	1,019	1,103	2,675	1,223	7,860	3,200	1,211
21	3,725	2,420	4,325	1,807	510	2,053	983	2,390	1,103	5,880	2,480	3,125
22	7,230	2,319	6,600	1,703	490	5,105	1,079	1,612	1,007	4,700	2,235	4,625
23	7,230	2,465	10,110	1,638	410	4,400	2,123	1,223	887	3,950	2,193	4,250
24	5,190	2,249	18,975	1,547	410	5,700	2,825	983	863	3,650	2,375	3,350
25	4,100	2,137	17,295	1,378	410	4,550	1,352	983	827	3,425	2,277	3,125
26	4,025	2,081	12,350	1,378	362	3,875	959	3,575	772	2,975	1,755	2,900
27	3,575	1,969	8,495	1,287	362	2,975	815	3,500	716	2,825	1,651	2,480
28	3,650	7,410	6,690	1,187	362	2,263	727	2,435	772	2,750	1,729	1,859
29	5,275	-------	5,970	1,091	390	2,151	727	16,560	749	2,900	1,469	1,859
30	13,850	-------	5,020	1,067	362	2,435	815	16,035	749	2,900	1,495	1,885
31	14,775	-------	7,140	-------	314	-------	749	11,450	-------	2,750	-------	1,820
1904.												
1	1,781	3,050	3,500	9,920	5,190	2,825	749	1,365	875	3,650	1,521	1,430
2	1,955	2,900	3,200	13,051	4,400	2,291	911	2,750	899	2,375	1,495	1,175
3	1,781	2,900	3,950	10,680	3,800	1,969	793	3,125	875	1,768	1,391	995
4	1,820	2,900	5,750	8,400	3,200	1,781	771	2,420	899	1,508	1,326	935
5	2,137	2,675	9,000	6,510	2,900	2,081	661	1,651	815	1,378	1,287	818
6	2,333	2,235	8,500	7,680	2,585	2,011	640	2,193	815	1,248	1,456	899
7	2,137	4,250	8,300	8,040	2,333	1,677	661	2,095	760	1,248	1,534	995
8	2,028	15,090	8,985	9,160	2,123	1,560	738	1,599	672	1,187	1,443	935
9	1,997	18,030	11,400	9,350	1,955	2,420	630	1,365	650	1,091	1,378	783
10	1,859	15,930	10,700	13,150	1,807	4,100	550	1,261	650	995	1,378	705
11	1,729	11,350	8,950	12,050	1,677	2,495	450	1,211	550	1,300	1,313	738
12	1,625	8,590	6,670	9,065	1,573	1,859	650	1,139	460	3,500	1,313	783
13	1,560	6,600	5,700	7,320	1,469	1,560	705	1,055	460	5,615	1,248	875
14	1,495	5,190	4,950	6,240	1,417	1,430	500	935	490	3,875	1,261	705
15	1,430	4,400	4,170	5,275	1,573	1,339	550	899	1,352	2,675	1,175	818
16	1,430	6,420	3,600	4,850	3,125	1,927	760	815	1,127	1,755	1,339	818
17	1,391	7,860	3,020	4,700	3,125	1,378	815	875	839	1,781	1,365	818
18	1,430	7,590	2,800	4,700	2,361	1,163	2,137	782	694	1,573	1,175	818
19	1,625	6,600	2,680	4,700	2,081	1,043	1,955	705	550	1,443	1,139	760
20	1,820	5,700	3,015	4,475	3,050	1,043	1,339	971	510	1,391	1,115	760
21	1,625	5,020	3,555	4,100	2,750	1,043	1,091	2,333	610	983	1,339	760
22	1,625	4,625	3,350	4,100	2,165	1,019	1,019	1,885	851	8,970	2,305	760
23	8,130	5,020	9,920	4,100	1,846	899	815	4,475	827	7,050	2,137	818
24	9,730	6,330	17,715	4,025	2,207	760	1,365	3,425	716	4,325	1,885	1,139
25	10,490	6,420	19,290	4,325	1,846	694	1,261	2,095	2,165	3,200	1,729	1,885
26	7,860	5,190	28,280	4,775	1,755	694	1,139	1,651	1,781	3,200	1,651	1,560
27	6,330	4,475	28,540	4,325	1,885	620	1,495	1,495	1,612	2,975	1,469	2,193
28	5,105	4,025	19,830	7,770	1,885	610	1,521	1,300	1,430	2,480	1,211	12,750
29	4,250	3,950	11,450	7,860	1,775	610	2,095	1,115	1,175	2,137	995	13,810
30	3,950	-------	8,590	6,420	1,573	640	2,450	995	2,480	1,927	1,495	7,770
31	3,500	-------	8,590	-------	2,249	-------	1,651	899	-------	1,651	-------	401

The daily discharge during January, February, and March is only approximate, owing to the ice conditions. From March 4 to 22, 1904, the discharge was estimated from the measurement of March 8, which was approximately 50 per cent of normal conditions. This was due to an ice gorge.

Estimated monthly discharge of Chenango River at Binghamton, N. Y., 1901–1904.

[Drainage area 1,530 square miles.]

Month.	Discharge in second-feet.			Run-off.			Rainfall in inches.
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.	Per cent of rainfall.	
1901.							
August	2,165	208	576	0.38	0.44	9	4.50
September	1,091	304	524	.34	.38	12	3.12
October	1,846	480	807	.53	.61	31	1.88
November	3,800	285	1,204	.78	.87	31	2.70
December	27,630	1,115	4,750	3.10	3.57	65	5.34
1902.							
January	5,105	827	1,960	1.28	1.48	108	1.33
February	5,530	804	1,339	.87	.91	29	2.99
March	35,950	4,325	11,717	7.64	8.81	241	3.56
April	5,700	1,417	3,246	2.12	2.37	136	1.68
May	2,067	782	1,307	.85	.98	36	2.64
June	8,495	1,235	1,820	1.19	1.33	22	5.87
July	17,400	1,859	6,011	3.92	4.52	54	8.07
August	6,510	827	2,002	1.30	1.50	48	3.07
September	3,575	410	809	.53	.59	17	3.28
October	10,680	1,187	2,539	1.66	1.91	47	3.92
November	4,175	1,313	1,999	1.30	1.43	117	1.21
December	15,405	1,248	4,273	2.79	3.22	71	4.36
The year	35,950	410	3,252	2.12	29.07	67	41.97
1903.							
January	14,775	2,081	5,289	3.44	3.99	145	2.67
February	14,050	1,807	5,291	3.44	3.58	142	2.45
March	20,600	4,325	10,114	6.59	7.40	147	5.03
April	7,770	1,067	3,210	2.09	2.33	140	1.61
May	1,007	314	608	.40	.46	142	.31
June	5,700	103	1,737	1.13	1.26	19	6.62
July	2,825	570	1,039	.68	.78	20	3.79
August	16,560	600	2,812	1.83	2.11	31	6.72
September	7,500	716	1,763	1.15	1.28	81	1.55
October	28,540	661	6,243	4.07	4.69	60	7.64
November	7,680	1,430	2,385	1.55	1.73	79	2.12
December	4,625	1,115	1,886	1.23	1.42	55	2.50
The year	28,540	103	3,532	2.30	31.21	71	43.00

Estimated monthly discharge of Chenango River at Binghamton, N. Y., 1901–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1904.					
January	10,490	1,391	3,160	2.06	2.37
February	18,030	2,235	6,390	4.17	4.50
March	28,540	2,680	8,966	5.84	6.73
April	13,150	4,025	7,037	4.59	5.12
May	5,190	1,417	2,376	1.55	1.79
June	4,100	610	1,518	.990	1.105
July	2,450	450	1,060	.691	.807
August	4,475	705	1,641	1.07	1.23
September	2,480	460	953	.621	.693
October	8,970	983	2,587	1.69	1.95
November	2,305	995	1,429	.932	1.04
December	13,810	401	1,981	1.29	1.49
The year	28,540	401	3,258	2.12	28.82

SUSQUEHANNA RIVER AT WILKESBARRE, PA.

The Wilkesbarre station was established by E. G. Paul on March 30, 1899.

The standard chain gage is located on the upstream side of the Market Street Bridge. The length of the chain from the end of the weight to the marker is 40.83 feet. The gage is read once each day by W. S. Bennett, the bridge keeper. When this gage was established, there was found to be a gage painted on the bridge pier, being a portion of one established by the Weather Bureau. The lower part of this gage, erected in January, 1898, originally consisted of heavy cast-brass plates graduated to feet and tenths. The gage plates were made in 4-foot sections and bolted to the stone bridge pier. The two lower sections of the brass plates had been torn away by ice, so that there was no graduation below the 8-foot mark, but readings were made by the figures painted on the stone pier. The zero of this old gage is at the base of the dressed-stone portion of the pier and is reported to be 535 feet above sea level. During low stages of the river the water recedes from the pier, rendering it impracticable to read the gage. So far as could be ascertained, this

has not been connected with the city datum. On account of the low water, which in 1897 had gone below the city datum, it was decided to put the zero of the new gage 4 feet below the zero of the old Weather Bureau gage, so as to obviate minus readings. In order, therefore, to compare with former records, it is necessary to add 4 feet to the old figures. The danger mark of this Weather Bureau gage is at 14 feet, or 18 feet of new gage, as at this elevation the west bank of the river is under water in places. River reports from this locality were furnished as early as 1888. During low water measurements were made by wading at a better cross section, at Retreat, 10 miles below Wilkesbarre. The elevation of the Market Street toll bridge above the river bed requires 65 feet of cable to sound across the section.

Observations of fluctuations of Susquehanna River are made by the Weather Bureau above Wilkesbarre, at Towanda, Pa., where the drainage area is estimated to be 8,000 square miles. The river gage, made of iron 1 foot wide and one-half inch thick, is on the east side of the road bridge over Susquehanna River, and is securely bolted to the masonry of the pier. The graduation is from 0 to 25 feet. The highest water was 29 feet in March, 1869, and the lowest, −0.1 foot, in October, 1895. The danger line is at 16 feet. The elevation of the zero is 633.7 feet.

Discharge measurements are made from the downstream side of the bridge, which has a total span of 700 feet between abutments. The initial point for soundings is the end of the iron handrail on the left bank, downstream side. The channel is straight for about one-fourth mile above and below the station. There is a bar across the river about one-half mile above the station, and another at about the same distance below, with deep water between these two points. This makes a sluggish current at low stages. The right bank is low and overflows at a gage height of about 20 feet. The left bank is above ordinary floods. The bed of the stream is composed of sand and gravel and is somewhat shifting. There is but one channel, broken by 3 bridge piers. There are a few willows growing under the right span. The bench mark is the extreme west end of the stone doorsill of the north entrance to the Coal Exchange Building. Its elevation is 32.99 feet above gage datum.

Discharge measurements of Susquehanna River at Wilkesbarre, Pa., 1899–1904.

Date.	Hydrographer.	Gage height.	Area of section.	Mean velocity.	Discharge.
1899.		*Feet.*	*Sq. ft.*	*Ft. per sec.*	*Sec.-ft.*
Mar. 30	E. G. Paul	9.00	6,846	3.62	24,800
June 6	do	4.30	3,064	1.20	3,668
July 26[a]	do	2.80	1,223	1.57	1,924
July 27	do	2.80	1,508	.90	1,357
Sept. 17	do	2.30	2,193	.38	851
Sept. 18[a]	do	2.30	1,115	.98	1,096
Oct. 16	do	2.35	1,054	1.06	1,114
1900.					
May 20	E. G. Paul	5.60	3,599	1.88	6,772
Sept. 26[a]	do	2.20	1,023	.93	961
1901.					
Aug. 20	E. G. Paul	3.10	3,154	.69	2,170
1902.					
Sept. 20	E. G. Paul	3.10	3,154	.69	2,170
1903.					
Mar. 4	E. C. Murphy	13.50	9,996	4.61	46,112
Apr. 8	do	8.86	6,920	3.37	23,247
Aug. 4	John C. Hoyt	4.00	3,489	1.35	4,718
Oct. 10	W. C. Sawyer	19.00	13,163	6.57	86,500
1904.					
July 20	N. C. Grover	4.05	3,864	1.13	4,382
July 21[b]	do	4.20	4,077	1.15	4,680
Sept. 15	John C. Hoyt	3.70	3,670	.96	3,540
Oct. 1	do	4.75	4,220	1.44	6,090
Nov. 5	H. D. Comstock	4.61	4,218	1.47	6,189
Nov. 7	do	4.49	4,057	1.39	5,660

[a] Measured at Retreat. [b] Measured at Pittston.

Mean daily gage height, in feet, of Susquehanna River at Wilkesbarre, Pa., 1899–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	......	......	......	8.40	6.40	4.50	3.60	2.70	3.10	2.50	2.50	3.40
2	......	......	......	8.10	6.20	5.50	3.30	2.60	2.90	2.50	3.00	3.40
3	......	......	......	7.70	6.30	5.30	3.30	2.70	2.60	2.50	8.30	3.40
4	......	......	......	7.20	6.30	5.10	3.20	2.60	2.60	2.50	6.70	3.40
5	......	......	......	6.90	6.40	4.60	3.00	3.20	2.50	2.50	7.30	3.50
6	......	......	......	6.90	6.10	4.30	3.00	3.00	2.50	2.60	6.60	3.50
7	......	......	......	7.40	5.70	3.60	2.80	2.80	2.50	2.60	6.90	3.50
8	......	......	......	10.35	5.60	3.50	2.90	2.50	2.40	2.50	5.30	3.70
9	......	......	......	14.10	5.40	3.50	2.80	2.50	2.40	2.50	5.00	3.60
10	......	......	......	14.20	5.30	3.50	2.80	2.50	2.40	2.50	4.50	3.50
11	......	......	......	12.80	5.10	3.30	2.80	2.50	2.40	2.50	4.20	3.50
12	......	......	......	11.10	5.20	3.20	2.90	2.50	2.50	2.50	4.30	3.60
13	......	......	......	11.30	5.10	3.20	2.90	2.70	2.50	2.40	4.90	7.70
14	......	......	......	14.00	5.00	3.20	3.00	2.80	2.50	2.40	4.70	9.60
15	......	......	......	14.30	5.00	3.00	3.20	2.80	2.40	2.40	4.60	9.60
16	......	......	......	13.90	4.80	3.10	3.30	2.80	2.40	2.40	4.50	8.50
17	......	......	......	13.40	4.80	3.20	3.10	2.90	2.30	2.30	5.20	7.70
18	......	......	......	12.50	4.70	3.20	3.00	2.70	2.30	2.30	5.20	7.30
19	......	......	......	11.30	4.90	3.00	3.00	2.40	2.30	2.30	5.30	6.50
20	......	......	......	10.50	4.90	3.00	3.00	2.30	2.30	2.30	5.00	6.50
21	......	......	......	9.90	5.40	3.10	3.10	2.30	2,30	2.30	4.70	8.30
22	......	......	......	9.40	5.90	3.00	3.00	2.60	2.30	2.30	4.60	8.40
23	......	......	......	9.00	5.80	3.00	3.00	2.50	2.30	2.30	4.30	7.40
24	......	......	......	8.50	5.70	2.90	2.90	2.50	2.30	2.30	4.20	6.60
25	......	......	......	8.00	5.50	2,90	2.80	2.40	2.20	2.30	4.00	8.40
26	......	......	......	7.40	5.40	3.10	2.80	2.40	2.50	2.20	3.80	8.00
27	......	......	......	7.60	5.10	3.10	2.80	2.40	2.40	2.30	3.80	7.40
28	......	......	......	7.40	4 90	3.30	2.80	2.40	2.50	2.30	3.70	6.30
29	......	......	......	7.10	4.80	3.80	2.80	4.60	2.50	2.50	3.60	9.10
30	......	......	9.00	6.60	4.80	4.00	2.60	4.10	2.60	2.50	3.50	7.90
31	......	......	8.70	......	4.70	......	2.60	3.40	......	2.50	......	7.70
1900.												
1	6.80	7.40	10.40	6.90	6.10	3.80	3.00	3.20	3.10	2.30	2.70	10.50
2	6.20	6.80	17.75	7.50	5.80	3.70	2.80	3.20	3.00	2.30	2.60	9.20
3	6.40	6.30	14.55	9.80	5.50	4.20	2.70	3.00	3.10	2.30	2.60	8.10
4	6.80	6.50	11.80	11.40	5.30	3.90	2.90	2.90	3.00	2.30	2.50	7.40
5	7.00	8.40	9.90	11.10	5.20	3.70	2.90	2.90	2.90	2.30	2.70	9.20
6	7.00	8.50	8.40	9.40	5.00	3.80	3.40	2.90	2.80	2.20	2.80	11.90
7	6.90	7.90	8.20	9.60	4.80	3.70	3.90	2.90	2.70	2.10	3.00	11.30
8	6.80	7.80	8.10	11.70	4.70	3.60	3.60	2.90	2.70	2.10	2.90	9.90
9	6.50	14.45	7.70	12.20	4.60	3.60	3.40	2.90	2.60	2.20	2.90	8.90
10	6.10	9.20	8.40	10.90	4.50	3.80	3.20	2.80	2.60	2.20	2.90	8.20
11	5.80	9.80	9.00	9.20	4.50	3.90	3.10	2.80	2.70	2.20	3.00	7.50
12	5.90	9.20	7.80	7.90	4.80	4.30	2.90	2.70	2.70	2.20	3.10	6.60
13	5.60	9.20	6.80	7.30	4.90	4.30	3.00	2.70	2.70	2.20	3.30	6.20
14	5.90	12.10	6.30	7.70	4.80	4.80	3.00	2.60	2.50	2.20	3.50	6.10
15	5.60	13.65	5.70	8.10	4.70	4.30	3.00	2.60	2.40	2.20	3.50	[a]10.30
16	5.50	11.80	5.70	7.80	4.70	4.00	3.00	2.60	2.50	2.30	3.40	9.80
17	5.50	9.20	9.00	7.60	4.90	3.80	2.90	2.50	2.40	2.40	3.30	9.20
18	5.20	7.70	8.10	10.03	5.00	3.60	2.90	2.50	2.30	2.40	3.20	8.70
19	5.10	8.90	8.30	12.45	5.10	3.50	2.80	2.40	2.20	2.50	3.20	9.20
20	5.80	10.70	8.50	12.40	5.60	3.40	3.10	2.50	2.20	2.70	3.10	9.60
21	14.65	9.80	10.85	11.10	5.20	3.30	3.20	2.50	2.10	2.60	3.10	9.40
22	16.85	11.40	9.70	10.00	5.00	3.20	3.10	2.50	2.20	2.60	3.20	9.00
23	13.50	16.10	9.20	9.50	4.80	3.50	3.00	2.80	2.20	2.70	3.60	8.80
24	10.30	14.75	8.40	11.30	4.60	3.30	2.90	3.00	2.20	2.90	4.00	9.20
25	8.50	11.00	9.90	10.70	4.50	3.30	2.90	2.90	2.20	2.80	4.30	8.80
26	7.80	8.80	8.70	9.50	4.30	3.20	4.00	2.60	2.20	2.80	4.70	12.80
27	7.90	7.00	8.10	8.40	4.10	3.20	3.70	2.70	2.30	2.70	16.75	14.20
28	6.20	8.50	7.10	7.50	4.00	3.10	3.40	2.80	2.20	2.70	20.75	12.90
29	9.20	......	7.00	6.90	3.90	3.10	3.20	2.80	2.20	2.70	14.65	12.40
30	9.00	......	6.80	6.50	3.80	3.10	3.20	3.10	2.30	2.70	11.80	11.40
31	8.70	......	6.50	......	3.70	......	3.30	3.10	......	2.60	......	11.40

[a] Ice backed water at gage.

Mean daily gage height, in feet, of Susquehanna River at Wilkesbarre, Pa., 1899–1904—Continued.

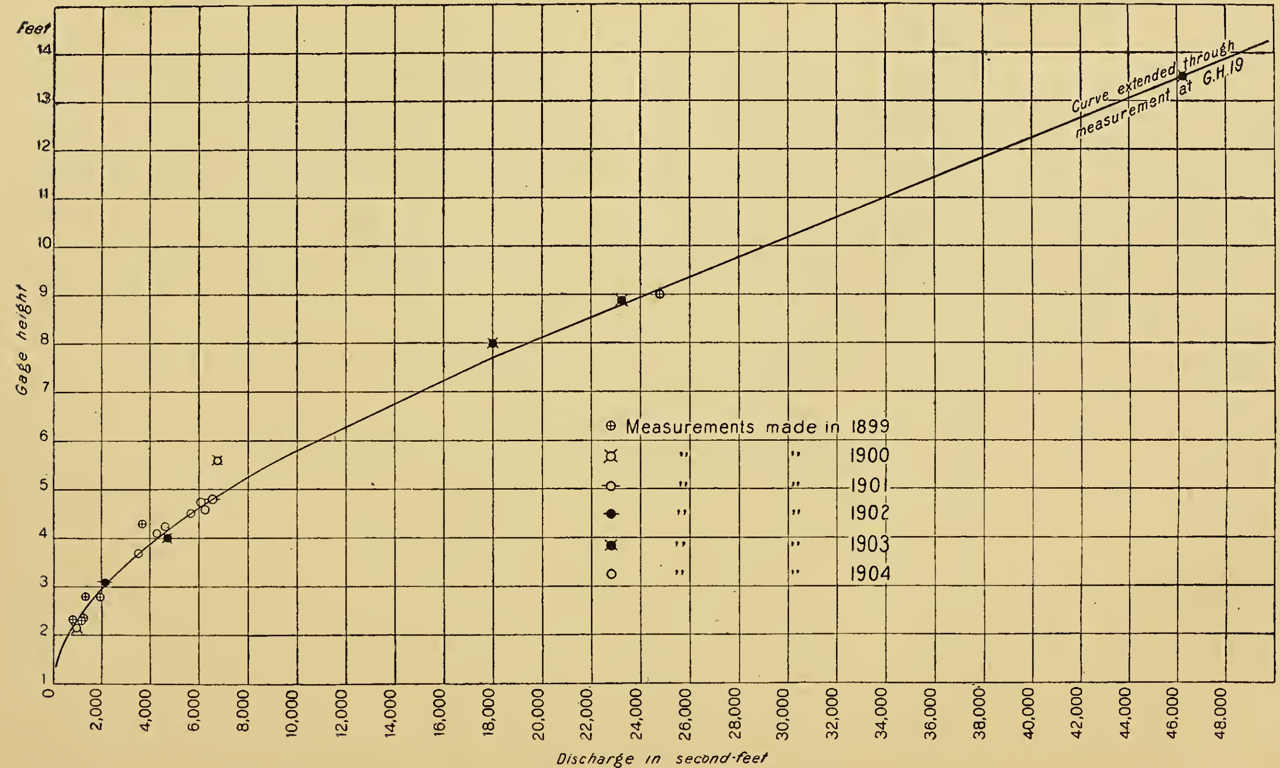
Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	10.60	8.60	6.20	9.70	7.80	14.55	4.50	3.40	5.80	3.90	3.20	7.30
2	10.60	8.40	6.10	8.80	7.20	11.70	4.00	3.20	5.60	3.70	3.20	6.70
3	9.50	8.30	6.10	8.30	8.70	11.00	3.50	3.00	5.70	4.00	3.10	6.80
4	8.70	8.40	6.10	9.30	8.90	10.60	3.60	3.00	5.30	4.30	3.10	[a]9.30
5	8.50	8.00	6.20	10.80	8.10	9.20	3.60	3.00	5.00	4.00	3.00	9.90
6	7.20	7.80	6.00	11.90	7.50	8.10	3.60	3.00	4.50	3.90	3.00	9.40
7	7.10	7.80	5.90	16.20	6.80	8.10	4.30	3.00	4.20	3.70	3.00	9.00
8	7.00	7.70	5.80	18.05	6.30	9.00	4.00	3.30	3.80	3.60	3.00	8.30
9	7.90	7.70	5.70	16.90	5.90	9.30	4.00	3.20	3.70	3.40	3.00	8.70
10	7.90	7.50	6.50	14.70	5.80	8.90	3.90	3.10	3.50	3.30	3.00	11.70
11	7.80	7.60	8.40	13.20	6.40	8.00	3.80	3.20	3.30	3.20	2.90	12.10
12	7.80	7.60	18.80	11.80	7.80	7.20	3.80	3.30	3.30	3.20	3.00	11.70
13	8.10	7.40	12.20	10.70	9.50	6.50	3.60	3.10	3.30	3.30	3.00	10.10
14	9.00	6.90	9.70	10.10	9.80	6.10	3.50	3.10	3.30	3.50	3.50	8.80
15	12.00	7.00	8.90	9.60	9.10	5.90	3.40	3.20	3.20	4.10	4.00	20.40
16	14.50	7.10	9.10	9.30	8.00	5.70	3.20	3.60	3.30	4.30	4.70	26.75
17	14.00	7.30	8.80	8.90	7.10	5.50	3.20	3.70	3.50	4.40	4.50	22.80
18	13.60	7.30	8.30	8.50	6.70	5.30	3.60	8.15	3.80	4.30	4.20	15.60
19	12.50	7.20	8.00	8.10	6.80	4.90	3.40	5.60	4.00	4.20	4.10	11.00
20	11.50	6.90	10.10	7.90	7.00	4.70	3.30	4.80	4.20	4.00	4.00	8.20
21	9.40	6.90	12.15	11.05	7.10	4.60	3.10	4.60	4.10	3.90	4.00	7.80
22	10.50	6.70	14.80	18.10	6.50	4.40	3.00	6.95	3.90	3.80	3.90	9.50
23	11.00	6.80	14.50	17.10	6.40	4.50	3.10	6.90	3.70	3.70	3.80	11.20
24	11.00	6.40	12.90	14.80	7.90	5.60	3.10	6.50	3.50	3.70	3.80	11.70
25	11.70	6.40	12.90	14.70	9.00	5.70	3.00	10.50	3.40	3.60	6.00	13.70
26	11.00	6.30	13.80	13.60	8.30	5.70	3.00	9.20	3.20	3.40	9.10	13.50
27	10.50	6.20	17.15	12.30	7.60	5.00	2.90	7.10	3.20	3.40	7.60	13.30
28	10.00	6.30	21.40	11.00	7.40	4.20	2.90	6.10	3.10	3.40	6.20	12.80
29	9.50	-------	19.45	9.60	10.60	4.50	3.00	5.30	3.30	3.20	5.50	13.10
30	9.30	-------	15.50	8.60	16.85	4.20	3.30	4.80	3.80	3.10	5.70	13.10
31	9.10	-------	12.90	-------	17.55	-------	3.60	4.90	-------	3.10	-------	13.50
1902.												
1	14.00	12.70	29.57	9.70	5.00	4.10	10.60	8.80	3.60	9.60	9.50	5.10
2	13.00	11.40	30.75	9.20	4.90	4.00	10.50	9.50	3.50	10.80	8.20	5.00
3	12.10	10.80	30.05	9.00	5.10	3.90	8.30	11.10	3.40	10.60	7.40	5.00
4	10.90	10.70	25.25	8.50	5.10	3.90	7.80	9.60	3.40	8.50	6.80	5.20
5	9.60	8.50	20.20	8.10	4.80	3.80	8.50	8.80	3.20	7.30	6.40	5.50
6	9.90	7.00	14.65	7.90	4.80	3.80	8.26	7.50	3.20	7.10	6.00	5.90
7	9.80	9.10	11.65	7.60	4.70	4.80	12.70	6.80	3.20	6.90	5.80	5.80
8	9.60	9.80	10.70	7.70	4.70	4.50	14.20	6.50	3.20	6.70	5.50	5.50
9	9.70	9.60	10.30	11.85	4.50	4.40	13.15	6.20	3.20	6.20	5.60	5.20
10	9.40	9.40	11.00	15.80	4.40	4.20	8.75	5.80	3.20	5.80	5.70	5.90
11	9.20	9.00	12.50	15.45	4.30	4.20	9.00	5.60	3.60	5.50	5.00	7.20
12	9.00	9.00	14.80	12.80	4.20	4.20	9.70	5.50	3.50	5.80	4.70	8.00
13	8.20	9.00	18.00	14.40	4.10	4.10	8.50	5.40	3.60	6.50	4.70	9.85
14	7.20	8.30	19.60	10.30	4.00	4.20	7.40	5.40	3.50	6.00	4.70	10.20
15	6.40	8.00	18.20	9.40	3.90	4.20	6.30	5.20	3.50	5.80	4.70	9.20
16	6.80	8.20	15.80	8.60	3.80	4.20	5.80	5.00	3.40	5.90	4.60	10.70
17	7.20	7.80	18.50	8.00	3.80	5.00	5.40	4.60	3.30	5.90	4.50	13.45
18	7.00	7.70	20.20	7.40	3.70	4.70	5.20	4.40	3.30	5.60	4.40	12.70
19	6.70	7.20	17.45	7.00	3.70	4.40	5.10	4.20	3.20	5.30	4.30	12.40
20	6.10	6.60	14.30	6.70	3.60	4.60	5.40	4.10	3.10	4.90	4.20	11.30
21	6.20	6.60	11.60	6.40	3.50	4.30	12.10	4.00	3.10	4.80	4.20	10.00
22	10.60	6.50	10.20	6.20	3.50	4.30	15.90	4.00	3.00	4.90	4.20	15.60
23	16.70	6.40	9.70	6.00	3.50	4.20	13.90	4.00	3.00	5.20	4.10	17.65
24	12.20	7.20	9.60	5.70	3.70	4.20	13.45	3.90	3.00	5.00	4.10	16.35
25	10.70	7.20	9.50	5.50	3.70	4.20	13.85	3.90	3.00	4.70	4.10	13.70
26	9.70	7.70	9.00	5.20	3.70	4.20	14.90	3.80	4.20	4.70	4.10	11.00
27	8.90	8.80	8.50	5.00	3.80	4.10	11.70	3.70	7.10	4.60	4.50	9.70
28	8.20	14.03	8.00	4.80	3.90	3.90	9.70	3.60	6.00	7.62	4.70	8.50
29	7.70	-------	9.00	4.70	4.60	3.80	10.80	3.60	7.90	11.05	5.00	8.00
30	7.60	-------	10.40	4.90	4.60	5.10	10.60	3.60	10.70	12.05	5.20	7.00
31	13.30	-------	9.80	-------	4.20	-------	9.30	3.60	-------	11.10	-------	6.80

[a] River frozen over.

Mean daily gage height, in feet, of Susquehanna River at Wilkesbarre, Pa., 1899–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	8.50	15.30	20.40	11.20	4.80	3.00	6.90	4.60	13.80	3.60	5.60	7.20
2	11.00	13.10	19.94	12.00	4.60	3.00	6.80	4.60	11.90	3.60	5.60	7.30
3	12.80	13.00	16.28	10.70	4.40	3.00	6.10	4.30	9.90	3.60	5.40	7.50
4	13.00	14.65	13.60	9.70	4.30	2.90	5.50	4.00	8.40	3.60	5.20	6.70
5	13.50	18.78	11.30	9.80	4.20	2.90	5.40	4.80	7.40	3.60	5.00	5.20
6	9.70	16.50	10.50	9.90	4.10	2.90	5.50	6.70	6.70	3.70	5.00	4.50
7	8.10	13.90	12.10	8.70	4.00	2.90	7.30	7.90	6.20	3.80	5.00	4.20
8	7.90	11.30	11.60	8.80	4.00	2.90	7.30	7.60	5.80	4.70	5.20	4.20
9	6.90	10.00	16.20	10.60	4.00	3.00	9.40	6.80	5.53	10.70	5.30	4.30
10	6.80	8.60	18.60	10.80	3.80	3.00	4.80	6.00	5.30	19.20	5.00	4.10
11	10.70	8.00	17.94	9.80	3.70	2.90	4.40	5.70	5.20	21.25	4.90	4.00
12	10.00	8.50	18.91	9.00	3.70	3.60	4.30	5.40	5.30	21.15	4.70	3.70
13	9.50	9.10	17.80	8.90	3.60	6.60	4.00	5.50	6.00	18.15	4.60	3.90
14	9.10	11.00	15.70	8.30	3.50	5.00	3.80	5.20	5.60	13.70	4.50	4.70
15	9.10	10.80	13.20	12.20	3.50	7.50	3.70	4.90	5.20	10.50	4.40	4.80
16	10.00	9.30	11.70	14.20	3.50	6.40	3.60	4.70	4.80	9.00	4.20	5.80
17	10.50	8.40	10.60	12.30	3.40	5.80	3.60	4.50	4.60	8.00	7.90	6.60
18	10.40	7.40	9.90	10.50	3.40	5.20	3.40	4.30	5.20	8.30	12.90	6.80
19	9.60	10.00	9.60	9.00	3.30	5.00	4.30	3.90	4.80	12.50	13.70	6.30
20	8.70	9.20	9.20	8.00	3.30	4.80	4.60	3.70	5.00	12.40	10.80	5.80
21	8.60	9.40	8.70	7.30	3.30	4.70	4.80	3.80	4.80	10.90	8.70	8.90
22	9.40	10.00	8.30	6.80	3.50	6.80	5.10	5.60	4.70	9.40	7.10	9.00
23	9.80	10.50	13.92	6.40	3.30	8.00	4.70	5.30	4.40	8.30	6.70	8.40
24	10.40	10.90	20.88	6.10	3.30	8.93	4.40	5.00	4.20	7.50	6.20	8.00
25	10.00	11.20	21.16	5.90	3.10	9.45	4.40	4.60	4.00	7.00	6.20	7.50
26	9.60	10.40	18.00	5.70	3.10	10.40	6.10	4.40	3.90	6.80	6.10	7.10
27	8.70	9.60	15.40	5.50	3.10	10.20	5.20	4.30	3.80	6.50	5.80	7.20
28	8.20	10.20	12.60	5.30	3.10	8.00	4.50	5.40	3.80	6.20	5.50	10.40
29	8.20	-------	10.70	5.10	3.00	6.90	4.10	9.15	3.70	6.00	6.00	9.70
30	14.54	-------	9.90	4.90	3.00	7.60	4.20	19.40	3.60	5.80	7.70	9.20
31	17.60	-------	9.80	-------	3.00	-------	4.70	16.83	-------	5.60	-------	8.40
1904.												
1	9.00	14.00	10.80	12.00	11.50	5.70	3.50	4.80	3.70	4.80	5.30	4.20
2	8.90	13.00	10.90	15.10	10.50	7.40	3.50	4.40	3.60	5.40	5.10	4.10
3	8.50	12.30	11.15	15.80	9.40	7.00	3.50	4.20	3.50	5.90	4.90	4.20
4	7.20	11.60	16.50	14.00	8.40	6.40	3.50	4.30	3.40	5.20	4.80	4.20
5	6.50	11.00	[a]18.20	12.00	7.60	6.00	3.50	5.30	3.40	4.70	4.60	3.60
6	6.70	[b]10.90	17.20	10.70	7.00	9.10	3.50	5.00	3.30	4.50	4.50	3.30
7	7.20	11.60	17.90	10.20	6.70	7.40	3.60	4.40	3.30	4.30	4.50	3.50
8	7.20	[c]21.70	25.20	10.50	6.30	6.40	3.70	4.60	3.30	4.00	4.50	3.60
9	7.30	25.30	[d]30.60	11.00	6.00	6.60	4.20	5.00	3.50	4.00	4.50	3.30
10	7.40	24.60	26.60	11.70	5.70	11.60	3.80	4.40	3.50	3.90	4.50	3.20
11	7.30	23.80	24.00	16.20	5.50	10.90	3.70	4.60	3.30	3.80	4.40	3.10
12	7.10	22.00	[e]22.00	14.30	5.20	8.50	4.10	4.00	3.30	3.80	4.40	3.30
13	7.00	20.30	[e]19.30	12.10	5.00	7.10	4.50	3.90	3.20	3.90	4.30	3.20
14	7.00	[f]18.00	[e]17.40	10.80	4.80	6.20	4.20	3.80	3.10	7.00	4.20	3.30
15	6.70	17.00	[e]15.90	9.70	4.80	5.60	3.90	3.60	3.60	8.30	4.30	3.20
16	6.40	15.70	[e]14.90	8.90	6.10	5.20	3.80	3.50	5.50	6.90	4.30	3.30
17	6.20	14.70	[e]14.00	8.30	8.00	5.10	3.60	3.40	4.30	6.00	4.30	3.30
18	6.00	12.90	[e]13.00	8.00	7.90	5.60	3.90	3.30	4.80	5.50	4.40	3.30
19	[g]5.90	12.60	[e]12.50	7.90	7.10	4.80	3.60	3.30	4.40	5.10	4.30	3.30
20	5.60	[h]12.90	12.80	7.90	11.20	4.50	3.70	3.20	4.10	4.80	4.30	3.40
21	[i]5.60	12.70	13.60	7.80	10.20	4.30	4.20	3.20	3.80	5.00	4.30	3.40
22	6.00	12.90	10.50	7.40	8.50	4.10	3.80	3.30	3.60	8.60	4.60	3.40
23	12.70	13.70	9.70	7.10	7.30	4.30	3.50	3.70	3.40	10.20	4.60	3.30
24	[j]18.20	12.80	16.90	7.10	6.50	4.00	3.40	4.90	3.40	10.20	5.30	3.50
25	13.50	12.70	16.90	7.00	6.50	3.90	3.30	6.40	3.40	8.80	5.50	3.60
26	[k]11.60	12.60	20.40	6.90	6.70	3.80	3.40	5.80	4.00	7.40	5.20	3.30
27	[k]10.10	12.00	22.90	7.20	6.50	3.70	3.70	5.30	5.40	6.90	5.00	3.50
28	[k]9.00	12.00	22.70	7.90	5.90	3.50	3.60	4.60	5.30	6.70	4.80	10.00
29	[k]8.20	11.50	18.40	12.40	6.00	3.50	3.60	4.30	5.20	6.40	4.20	13.85
30	[k]9.20	-------	14.20	12.80	5.50	3.40	3.80	4.10	4.70	6.00	4.20	13.30
31	13.90	-------	11.70	-------	5.30	-------	4.10	3.90	-------	5.90	-------	10.80

[a] Ice still unbroken.
[b] Closed with anchor ice as far up as Ransom.
[c] Ice started at 5.15 p. m.; moved until February 10, 12. m. Gorged below city.
[d] Highest gage reading 30.6.
[e] Still gorged.
[f] Ice blocked as far as Tunkhannock, Pa.
[g] Ice started at Pittston at 1.30 p. m., at Wilkesbarre, 2 p. m. River closed December 10 to 28, inclusive.
[h] Ice blocked as far as Laceyville, Pa.
[i] 12 midnight ice still running; stream nearly full.
[j] River full of running ice all day; 10 p. m. very little ice running.
[k] Anchor ice.



RATING CURVE FOR SUSQUEHANNA RIVER AT WILKESBARRE, PA.

Rating table for Susquehanna River at Wilkesbarre, Pa., from March 30, 1899, to December 31, 1904.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
2.0	620	4.3	5,070	6.6	13,170	9.8	28,200
2.1	720	4.4	5,340	6.7	13,590	10.0	29,200
2.2	820	4.5	5,620	6.8	14,010	10.2	30,100
2.3	930	4.6	5,910	6.9	14,440	10.4	31,100
2.4	1,050	4.7	6,210	7.0	14,870	10.6	32,100
2.5	1,180	4.8	6,520	7.1	15,300	10.8	33,000
2.6	1,320	4.9	6,830	7.2	15,730	11.0	34,000
2.7	1,470	5.0	7,150	7.3	16,160	11.2	35,000
2.8	1,630	5.1	7,470	7.4	16,600	11.4	36,000
2.9	1,810	5.2	7,800	7.5	17,040	11.6	37,000
3.0	2,000	5.3	8,140	7.6	17,490	11.8	37,900
3.1	2,200	5.4	8,490	7.7	17,950	12.0	38,900
3.2	2,410	5.5	8,850	7.8	18,420	12.2	39,900
3.3	2,620	5.6	9,210	7.9	18,900	12.4	40,800
3.4	2,840	5.7	9,580	8.0	19,380	12.6	41,800
3.5	3,070	5.8	9,950	8.2	20,360	12.8	42,800
3.6	3,300	5.9	10,330	8.4	21,340	13.0	43,700
3.7	3,540	6.0	10,720	8.6	22,320	13.2	44,700
3.8	3,780	6.1	11,120	8.8	23,300	13.4	45,700
3.9	4,030	6.2	11,520	9.0	24,300	13.8	47,600
4.0	4,280	6.3	11,930	9.2	25,300	14.0	48,600
4.1	4,540	6.4	12,340	9.4	26,200		
4.2	4,800	6.5	12,750	9.6	27,200		

Table based on discharge measurements of 1899, 1900, 1901, 1902, 1903, and 1904. Well defined between 2 feet gage height and 19 feet gage height. Tangent at 8.80 feet gage height with a difference of 500 per tenth. Table applied to tenths.

Mean daily discharge, in second-feet, of Susquehanna River at Wilkesbarre, Pa., 1899–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	-------	-------	-------	21,340	12,340	5,620	3,300	1,470	2,200	1,180	1,180	2,840
2	-------	-------	-------	19,870	11,520	8,850	2,620	1,320	1,810	1,180	2,000	2,840
3	-------	-------	-------	17,950	11,930	8,140	2,620	1,470	1,320	1,180	20,850	2,840
4	-------	-------	-------	15,730	11,930	7,470	2,410	1,320	1,320	1,180	13,590	2,840
5	-------	-------	-------	14,440	12,340	5,910	2,000	2,410	1,180	1,180	16,160	3,070
6	-------	-------	-------	14,440	11,120	5,070	2,000	2,000	1,180	1,320	13,170	3,070
7	-------	-------	-------	16,600	9,580	3,300	1,630	1,630	1,180	1,320	14,440	3,070
8	-------	-------	-------	30,850	9,210	3,070	1,810	1,180	1,050	1,180	8,140	3,540
9	-------	-------	-------	49,100	8,490	3,070	1,630	1,180	1,050	1,180	7,150	3,300
10	-------	-------	-------	49,600	8,140	3,070	1,630	1,180	1,050	1,180	5,620	3,070
11	-------	-------	-------	42,800	7,470	2,620	1,630	1.180	1,050	1,180	4,800	3,070
12	-------	-------	-------	34,500	7,800	2,410	1,810	1,180	1,180	1,180	5,070	3,300
13	-------	-------	-------	35,500	7,470	2,410	1,810	1,470	1,180	1,050	6,830	17,950
14	-------	-------	-------	48,600	7,150	2,410	2,000	1,630	1,180	1,050	6,210	27,200
15	-------	-------	-------	50,100	7,150	2,000	2,410	1,630	1,050	1,050	5,910	27,200
16	-------	-------	-------	48,100	6,520	2,200	2,620	1,630	1,050	1,050	5,620	21,830
17	-------	-------	-------	45,700	6,520	2,410	2,200	1,810	930	930	7,800	17,950
18	-------	-------	-------	41,300	6,210	2,410	2,000	1,470	930	930	7,800	16,160
19	-------	-------	-------	35,500	6,830	2,000	2,000	1,050	930	930	8,140	12,750
20	-------	-------	-------	31,600	6,830	2,000	2,000	930	930	930	7,150	12,750
21	-------	-------	-------	28,700	8,490	2,200	2,200	930	930	930	6,710	20,850
22	-------	-------	-------	26,200	10,330	2,000	2,000	1,320	930	930	5,910	21,340
23	-------	-------	-------	24,300	9,950	2,000	2,000	1,180	930	930	5,070	16,600
24	-------	-------	-------	21,830	9,580	1,810	1,810	1,180	930	930	4,800	13,170
25	-------	-------	-------	19,380	8,850	1,810	1,630	1,050	820	930	4,280	21,340
26	-------	-------	-------	16,600	8,490	2,200	1,630	1,050	1,180	820	3,780	19,380
27	-------	-------	-------	17,490	7,470	2,200	1,630	1,050	1,050	930	3,780	16,600
28	-------	-------	-------	16,600	6,830	2,620	1,630	1,050	1,180	930	3,540	11,930
29	-------	-------	-------	15,300	6,520	3,780	1,630	5,910	1,180	1,180	3,300	24,800
30	-------	-------	-------	13,170	6,520	4,280	1,620	4,540	1,320	1,180	3,070	18,900
31	-------	-------	-------	-------	6,210	-------	1,620	2,840	-------	1,180	-------	17,950
1900.												
1	14,010	16,600	31,100	14,440	11,120	3,780	2,000	2,410	2,200	930	1,470	31,600
2	11,520	14,010	75,900	17,040	9,950	3,540	1,630	2,410	2,000	930	1,320	25,300
3	12,340	11,930	52,200	28,200	8,850	4,800	1,470	2,000	2,200	930	1,320	19,870
4	14,010	12,750	37,900	36,000	8,140	4,030	1,810	1,810	2,000	930	1,180	16,600
5	14,870	21,340	28,700	34,500	7,800	3,540	1,810	1,810	1,810	930	1,470	25,300
6	14,870	21,830	21,340	26,200	7,150	3,780	2,840	1,810	1,630	820	1,630	38,400
7	14,440	18,900	20,360	27,200	6,520	3,540	4,030	1,810	1,470	720	2,000	35,500
8	14,010	18,420	19,870	37,400	6,210	3,300	3,300	1,810	1,470	720	1,810	28,700
9	11,930	51,600	17,950	39,900	5,910	3,300	2,840	1,810	1,320	820	1,810	23,800
10	11,120	25,300	21,340	33,500	5,620	3,780	2,410	1,630	1,320	820	1,810	20,360
11	9,950	28,200	24,300	25,300	5,620	4,030	2,200	1,630	1,470	820	2,000	17,040
12	10,330	25,300	18,420	18,900	6,520	5,070	1,810	1,470	1,470	820	2,200	13,170
13	9,210	25,300	14,010	16,160	6,830	5,070	2,000	1,470	1,470	820	2,620	11,520
14	10,330	39,400	11,930	17,950	6,520	6,520	2,000	1,320	1,180	820	3,070	11,120
15	9,210	46,900	9,580	19,870	6,210	5,070	2,000	1,320	1,050	820	3,070	30,600
16	8,850	37,900	9,580	18,420	6,210	4,280	2,000	1,320	1,180	930	2,840	28,200
17	8,850	25,300	24,300	17,490	6,830	3,780	1,810	1,180	1,050	1,050	2,620	25,300
18	7,800	17,950	19,870	29,400	7,150	3,300	1,810	1,180	930	1,050	2,410	22,810
19	7,470	23,800	20,850	41,000	7,470	3,070	1,630	1,050	820	1,180	2,410	25,300
20	9,950	32,600	21,830	40,800	9,210	2,840	2,200	1,180	820	1,470	2,200	27,200
21	52,900	28,200	33,200	34,500	7,800	2,620	2,410	1,180	720	1,320	2,200	26,200
22	68,800	36,000	27,700	29,200	7,150	2,410	2,200	1,180	820	1,320	2,410	24,300
23	46,200	63,200	25,300	26,700	6,520	3,070	2,000	1,630	820	1,470	3,300	23,300
24	30,600	53,600	21,340	35,500	5,910	2,620	1,810	2,000	820	1,810	4,280	25,300
25	21,830	34,000	28,700	32,600	5,620	2,620	1,810	1,810	820	1,630	5,070	23,300
26	18,420	23,300	22,810	26,700	5,070	2,410	4,280	1,320	820	1,630	6,210	42,800
27	18,900	14,870	19,870	21,340	4,540	2,410	3,540	1,470	930	1,470	68,000	49,600
28	11,520	21,830	15,300	17,040	4,280	2,200	2,840	1,630	820	1,470	102,200	43,300
29	25,300	-------	14,870	14,440	4,030	2,200	2,410	1,630	820	1,470	52,900	40,800
30	24,300	-------	14,010	12,750	3,780	2,200	2,410	2,200	930	1,470	37,900	36,000
31	22,810	-------	12,750	-------	3,540	-------	2,620	2,200	-------	1,470	-------	36,000

Mean daily discharge, in second-feet, of Susquehanna River at Wilkesbarre, Pa., 1899–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	32,100	22,320	11,520	27,700	18,420	51,300	5,620	2,840	9,950	4,030	2,410	16,160
2	32,100	21,340	11,120	23,300	15,730	37,400	4,280	2,410	9,210	3,540	2,410	13,590
3	26,700	20,850	11,120	20,850	22,810	34,000	3,070	2,000	9,580	4,280	2,200	14,010
4	22,810	21,340	11,120	25,800	23,800	32,100	3,300	2,000	8,140	5,070	2,200	25,800
5	21,830	19,380	11,520	33,000	19,870	25,300	3,300	2,000	7,150	4,280	2,000	28,700
6	15,730	18,420	10,720	38,400	17,040	19,870	3,300	2,000	5,620	4,030	2,000	26,200
7	15,300	18,420	10,330	63,900	14,010	19,870	5,070	2,000	4,800	3,540	2,000	24,300
8	14,870	17,950	9,950	78,400	11,930	24,300	4,280	2,620	3,780	3,300	2,000	20,850
9	18,900	17,950	9,580	69,200	10,330	25,800	4,280	2,410	3,540	2,840	2,000	22,810
10	18,900	17,040	12,750	53,300	9,950	23,800	4,030	2,200	3,070	2,620	2,000	37,400
11	18,420	17,490	21,340	44,700	12,340	19,380	3,780	2,410	2,620	2,410	1,810	39,400
12	18,420	17,490	84,700	37,900	18,420	15,730	3,780	2,620	2,620	2,410	2,000	37.400
13	19,870	16,600	39,900	32,600	26,700	12,750	3,300	2,200	2,620	2,620	2,000	29,600
14	24,300	14,440	27,700	29,600	28,200	11,120	3,070	2,200	2,620	3,070	3,070	23,300
15	38,900	14,870	23,800	27,200	24,800	10,330	2,840	2,410	2,410	4,540	4,280	98,900
16	52,000	15,300	24,800	25,800	19,380	9,580	2,410	3,300	2,620	5,070	6,210	166,300
17	48,600	16,160	23,300	23,800	15,300	8,850	2,410	3,540	3,070	5,340	5,620	122,300
18	46,700	16,160	20,850	21,830	13,590	8,140	3,300	20,110	3,780	5,070	4,800	59,500
19	41,300	15,730	19,380	19,870	14,010	6,830	2,840	9,210	4,280	4,800	4,540	34,000
20	36,500	14,440	29,600	18,890	14,870	6,210	2,620	6,520	4,800	4,280	4,280	20,360
21	26,200	14,440	39,600	34,200	15,300	5,910	2,200	5,910	4,540	4,030	4,280	18,420
22	31,600	13,590	54,000	78,800	12,750	5,340	2,000	14,655	4,030	3,780	4,030	26,700
23	34,000	14,010	52,000	70,800	12,340	5,620	2,200	14,440	3,540	3,540	3,780	35,000
24	34,000	12,340	43,300	54,000	18,900	9,210	2,200	12,750	3,070	3,540	3,780	37,400
25	37,400	12,340	43,300	53,300	24,300	9,580	2,000	31,600	2,840	3,300	10,720	47,100
26	34,000	11,930	47,600	46,700	20,850	9,580	2,000	25,300	2,410	2,840	24,800	46,200
27	31,600	11,520	71,100	40,300	17,490	7,150	1,810	15,300	2,410	2,840	17,490	45,200
28	29,200	11,930	108,400	34,000	16,600	4,800	1,810	11,120	2,200	2,840	11,520	42,800
29	26,700	....	90,300	27,200	32,100	5,620	2,000	8,140	2,620	2,410	8,850	44,200
30	25,800	....	58,800	22,320	68,900	4,800	2,620	6,520	3,780	2,200	9,580	46,200
31	24,800	....	43,300	....	74,300	....	3,300	6,830	....	2,200	....	....
1902.												
1	48,600	42,300	201,800	27,700	7,150	4,540	32,100	23,300	3,300	27,200	26,700	7,470
2	43,700	36,000	217,700	25,300	6,830	4,280	31,600	26,700	3,070	33,000	20,360	7,150
3	39,400	33,000	208,200	24,300	7,470	4,030	20,850	34,500	2,840	32,100	16,600	7,150
4	33,500	32,600	148,800	21,830	7,470	4,030	18,420	27,200	2,840	21,830	14,010	7,800
5	27,200	21,830	97,100	19,870	6,520	3,780	21,830	23,300	2,410	16,160	12,340	8,850
6	28,700	14,870	52,900	18,900	6,520	3,780	20,600	17,040	2,410	15,300	10,720	10,330
7	28,200	24,800	37,200	17,490	6,210	6,520	42,300	14,010	2,410	14,440	9,950	9,950
8	27,200	28,200	32,600	17,950	6,210	5,620	49,900	12,750	2,410	13,590	8,850	8,850
9	27,700	27,200	30,600	38,100	5,620	5,340	44,400	11,520	2,410	11,520	9,210	7,800
10	26,200	26,200	34,000	61,000	5,340	4,800	23,050	9,950	2,410	9,950	9,580	10,330
11	25,300	24,300	41,300	58,400	5,070	4,800	24,300	9,210	3,300	8,850	7,150	15,730
12	24,300	24,300	54,000	42,800	4,800	4,800	27,700	8,850	3,070	9,950	6,210	19,380
13	20,360	24,300	78,000	51,300	4,540	4,540	21,830	8,490	3,300	12,750	6,210	28,400
14	15,730	20,850	91,700	30,600	4,280	4,800	16,600	8,490	3,070	10,720	6,210	30,100
15	12,340	19,380	79,600	26,200	4,030	4,800	11,930	7,800	3,070	9,950	6,210	25,300
16	14,010	20,360	61,000	22,320	3,780	4,800	9,950	7,150	2,840	10,330	5,910	32,600
17	15,730	18,420	82,100	19,380	3,780	7,150	8,490	5,910	2,620	10,330	5,620	46,000
18	14,870	17,950	97,100	16,600	3,540	6,210	7,800	5,340	2,620	9,210	5,340	42,300
19	13,590	15,730	73,500	14,870	3,540	5,340	7,470	4,800	2,410	8,140	5,070	40,800
20	11,120	13,170	50,600	13,590	3,300	5,910	8,490	4,540	2,200	6,830	4,800	35,500
21	11,520	13,170	37,000	12,340	3,070	5,070	39,400	4,280	2,200	6,520	5,070	29,200
22	32,100	12,750	30,100	11,520	3,070	5,070	57,800	4,280	2,000	6,830	4,800	59,500
23	67,700	12,340	27,700	10,720	3,070	4,800	48,100	4,280	2,000	7,800	4,540	75,100
24	39,900	15,730	27,200	9,580	3,540	4,800	45,900	4,030	2,000	7,150	4,540	65,000
25	32,600	15,730	26,700	8,850	3,540	4,800	47,900	4,030	2,000	6,210	4,540	47,100
26	27,700	17,950	24,300	7,800	3,540	4,800	54,700	3,780	4,800	6,210	4,540	34,000
27	23,800	23,300	21,830	7,150	3,780	4,540	37,400	3,540	15,300	5,910	5,620	27,700
28	20,360	48,800	19,380	6,520	4,030	4,030	27,700	3,300	10,720	17,580	6,210	21,830
29	17,950	....	24,300	6,210	5,910	3,780	33,000	3,300	18,900	34,200	7,150	19,380
30	17,490	....	31,100	6,830	5,910	7,470	32,100	3,300	32,600	39,200	7,800	14,870
31	45,200	....	28,200	....	4,800	....	25,800	3,300	....	34,500	....	14,010

Mean daily discharge, in second-feet, of Susquehanna River at Wilkesbarre, Pa., 1899–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	21,830	57,400	98,900	35,000	6,520	2,000	14,440	5,910	47,600	3,300	9,210	15,730
2	34,000	44,200	94,700	38,900	5,910	2,000	14,010	5,916	38,400	3,300	9,210	16,160
3	42,800	43.700	64,500	32,600	5,340	2,000	11,120	5,070	28,700	3,300	8,490	17,040
4	43,700	53,000	46,700	27,700	5,070	1,810	8,850	4,280	21,340	3,300	7,800	13,590
5	46,200	84,500	35,500	28,200	4,800	1,810	8,490	6,520	16,600	3,300	7,150	7,800
6	27,700	66,100	31,600	28,700	4,540	1,810	8,850	13,590	13,590	3,540	7,150	5,620
7	19,870	48,100	39,400	22,810	4,280	1,810	16,160	18,900	11,520	3,780	7,150	4,800
8	18,900	33,500	37,000	23,300	4,280	1,810	16,160	17,490	9,950	6,210	7,800	4,800
9	14,440	29,200	63,900	32,100	4,280	2,000	26,200	14,010	8,960	32,600	8,140	5,070
10	14,010	22,320	83,000	33,000	3,780	2,000	6,520	10,720	8,140	88,100	7,150	4,540
11	32,600	19,380	77,300	28,200	3,540	1,810	5,340	9,580	7,800	106,900	6,830	4,280
12	29,200	21,830	85,600	24,300	3,540	3,300	5,070	8,490	8,140	106,000	6,210	3,540
13	26,700	24,800	76,300	23,800	3,300	13,170	4,280	8,850	10,720	79,200	5,910	4,030
14	24,800	34,000	60,300	20,850	3,070	7,150	3,780	7,800	9,210	47,100	5,620	6,210
15	24,800	33,000	44,700	39,900	3,070	17,040	3,540	6,830	7,800	31,600	5,340	6,520
16	29,200	25,800	37,400	49,900	3,070	12,340	3.300	6,210	6,520	24,300	4,800	9,950
17	31,600	21,340	32,100	40,300	2,840	9,950	3,300	5,620	5,910	19,380	18,900	13,170
18	31,100	16,600	28,700	31,600	2,840	7,800	2,840	5,070	7,800	20,850	43,300	14,010
19	27,200	29,200	27,200	24,300	2,620	7,150	5,070	4,030	6,520	41,300	47,100	11,930
20	22,810	25,300	25,300	19,380	2,620	6,520	5,910	3,540	7,150	40,800	33,000	9,950
21	22,320	26,200	22,810	16,160	2,620	6,210	6,520	3,780	6,520	33,500	22,810	23,800
22	26,200	29,200	20,850	14,010	3.070	14,010	7,470	9,210	6,210	26,200	15,300	24,300
23	28,200	31,600	48,100	12,340	2.620	19,380	6,210	8,140	5,340	20,850	13,590	21,340
24	31,100	33,500	103,400	11,120	2,620	24,050	5,340	7,150	4,800	17,040	11,520	19,380
25	29,200	35,000	106,100	10,330	2,220	26,500	5,340	5,910	4,280	14,780	11,520	17,040
26	27,200	31,100	78,100	9,580	2,200	31,100	11,120	5,340	4,030	14,010	11,120	15,300
27	22,810	27,200	58,100	8,850	2,200	30,100	7,800	5,070	3,780	12,750	9,950	15,730
28	20,360	30,100	41,800	8,140	2,200	19,380	5,620	8,490	3,780	11,520	8,850	31,100
29	20,360	-------	32,600	7,470	2,000	14,440	4,540	25,000	3,540	10,720	10,720	27,700
30	51,300	-------	28,700	6,830	2,000	17,490	4,800	90,000	3,300	9,950	17,950	25,300
31	66,100	-------	28,200	-------	2,000	-------	6.210	68,700	-------	9,210	-------	21,340
1904.												
1	24,300	48,600	16,600	38,900	36,500	9,580	3,070	6,520	3,540	6,520	8,140	4,800
2	23,800	43,700	16,900	56,000	31,600	16,600	3,070	5,340	3,300	8,490	7,470	4,540
3	21,830	40,300	18,350	61,000	26,200	14,870	3,070	4,800	3,070	10,330	6,830	4,800
4	15,730	37,000	33,300	48,600	21,340	12,340	3,070	5,070	2,840	7,800	6,520	4,800
5	12,750	34,000	40,100	38,900	17,490	10,720	3,070	8,140	2,840	6,210	5,910	3,300
6	13,590	33,500	36,100	32,600	14,870	24,800	3,070	7,150	2,620	5,620	5,620	2,620
7	15,730	37,000	38,900	30,100	13,590	16,600	3,300	5,340	2,620	5,070	5,620	3,070
8	15,730	55,900	74,760	31,600	11,930	12,340	3,540	5,910	2,620	4,280	5,620	3.300
9	16,160	75,100	108,700	34,000	10,720	13,170	4,800	7,150	3,070	4,280	5,620	2.620
10	16,600	71,300	82,900	37,400	9,580	37,000	3,780	5,340	3,070	4,030	5,620	2,410
11	16,160	67,000	68,000	63,900	8,850	33,500	3,540	5,910	2,620	3,780	5,340	2.200
12	15,300	57,600	57,600	50,600	7,800	21,830	4,540	4,280	2,620	3,780	5,340	2,620
13	14,870	49,400	44,900	39,400	7,150	15,300	5,620	4,030	2,410	4,030	5,070	2,410
14	14,870	39,300	36,800	33,000	6,520	11,520	4,800	3,780	2,200	14,870	4,800	2,620
15	13,590	35,300	31,100	27,700	6,520	9,210	4,030	3,300	3,300	20,850	5,070	2,410
16	12,340	30,350	27,500	23,800	11,120	7,800	3,780	3,070	8,850	14,440	5,070	2,620
17	11,520	26,800	31,000	20,850	19,380	7,470	3,300	2,840	5,070	10,720	5,070	2,620
18	10,720	21,850	30,000	19,380	18,900	9,210	4,030	2,620	6,520	8,850	5,340	2,620
19	10,330	21,050	35,500	18,900	15.300	6,520	3,300	2,620	5,340	7,470	5,070	2,620
20	9,210	21,850	42,800	18,900	35,000	5,620	3,540	2,410	4,540	6,520	5,070	2,840
21	9,210	21,350	46,700	18,420	30,100	5,070	4,800	2,410	3,780	7,150	5,070	2,840
22	10,720	21,850	31,600	16,600	21,830	4,540	3,780	2,620	3,300	22,320	5,910	2,840
23	42,300	23,700	27,700	15,300	16,160	5,070	3,070	3,540	2,840	30,100	5,910	2,620
24	79,600	21,550	69,200	15,300	12,750	4,280	2,840	6,830	2,840	30,100	8,140	3,070
25	46,200	21,350	69,200	14,870	12,750	4,030	2,620	12,340	2,840	23,300	8,850	3,300
26	37,000	21,500	98,900	14,440	13,590	3,780	2,840	9,950	4,280	16,600	7,800	2,620
27	29,600	19,600	123,400	15,730	12,750	3,540	3,540	8,140	8,490	14,440	7,150	3,070
28	24,300	19,600	121,300	18,900	10,330	3,070	3,300	5,910	8,140	13,590	6,520	29,200
29	20,360	18,350	81,300	40,800	10,720	3,070	3,300	5,070	7,800	12,340	4,800	47,850
30	25,300	-------	49,900	42,800	8,850	2,840	3,780	4,540	6,210	10,720	4,800	45,200
31	48,100	-------	37,400	-------	8,140	-------	4,540	4,030	-------	10,330	-------	33,000

From February 8 to March 19, 1904, discharges reduced 50 per cent on account of ice gorge.

Estimated monthly discharge of Susquehanna River at Wilkesbarre, Pa., 1899–1904.

[Drainage area, 9,810 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1899.					
April	50,100	13,170	28,773	2.93	3.27
May	12,340	6,210	8,574	.87	1.00
June	8,850	1,810	3,378	.34	.38
July	3,300	1,320	1,965	.20	.23
August	5,910	930	1,653	.17	.20
September	2,200	820	1,140	.12	.13
October	1,320	820	1,072	.11	.13
November	20,850	1,180	7,046	.72	.80
December	27,200	2,840	12,694	1.29	1.49
1900.					
January	68,800	7,470	18,279	1.86	2.14
February	63,200	11,930	28,226	2.88	3.00
March	75,900	9,580	23,780	2.42	2.79
April	41,000	12,750	26,348	2.69	3.00
May	11,120	3,540	6,583	.67	.77
June	6,520	2,200	3,506	.36	.40
July	4,280	1,470	2,320	.24	.28
August	2,410	1,050	1,635	.17	.20
September	2,200	720	1,239	.13	.15
October	1,810	720	1,120	.11	.13
November	102,200	1,180	10,858	1.11	1.24
December	49,600	11,120	27,374	2.79	3.22
The year	102,200	720	12,606	1.29	17.32

Estimated monthly discharge of Susquehanna River at Wilkesbarre, Pa., 1899–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1901.					
January	52,000	14,870	29,018	2.96	3.41
February	22,320	11,520	16,278	1.66	1.73
March	108,400	9,580	34,736	3.54	4.08
April	78,800	18,890	39,255	4.00	4.46
May	74,300	9,950	21,462	2.19	2.52
June	51,300	4,800	15,676	1.60	1.79
July	5,620	1,810	3,065	.31	.36
August	31,600	2,000	7,405	.75	.86
September	9,950	2,200	4,257	.43	.48
October	5,340	2,200	3,570	.36	.42
November	24,800	1,810	5,289	.54	.60
December [a]	166,300	13,590	41,752	4.26	4.91
The year	166,300	1,810	18,480	1.88	25.62
1902.					
January	67,700	11,120	26,905	2.74	3.16
February	48,800	12,340	23,055	2.35	2.45
March	217,700	19,380	66,697	6.80	7.84
April	61,000	6,210	21,867	2.23	2.49
May	7,470	3,070	4,847	.49	.56
June	7,470	3,780	4,968	.51	.57
July	57,800	7,470	29,013	2.96	3.41
August	34,500	3,300	10,073	.10	.12
September	32,600	2,000	4,918	.50	.56
October	39,200	5,910	14,976	1.53	1.76
November	26,700	4,540	8,395	.86	.96
December	75,100	7,150	26,112	2.66	3.07
The year	217,700	2,000	20,152	1.98	26.95

[a] Frozen December 4 to 31. Rating table assumed to apply correctly.

Estimated monthly discharge of Susquehanna River at Wilkesbarre, Pa., 1899–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second feet per square mile.	Depth in inches.
1903.					
January	66,100	14,010	29,310	2.99	3.45
February	84,500	16,600	34,970	3.56	3.71
March	106,100	20,850	53,502	5.45	6.28
April	49,900	6,830	23,656	2.41	2.69
May	6,520	2,000	3,388	.35	.40
June	31,100	1,810	10,265	1.05	1.17
July	26,200	2,840	7,877	.80	.92
August	90,000	3,540	13,071	1.33	1.53
September	47,600	3,300	10,932	1.11	1.24
October	106,900	3,300	27,377	2.79	3.22
November	47,100	4,800	12,986	1.32	1.47
December	31,100	3,540	13,583	1.38	1.59
The year	106,900	1,810	20,076	2.04	27.67
1904.					
January	79,600	9,210	21,860	2.23	2.57
February	75,100	18,350	35,720	3.64	3.92
March	123,400	16,600	52,530	5.34	6.16
April	63,900	14,440	31,290	3.19	3.56
May	36,500	6,520	15,750	1.61	1.86
June	37,000	2,840	11,180	1.14	1.27
July	5,620	2,620	3,636	.371	.428
August	12,340	2,410	5,194	.529	.610
September	8,850	2,200	4,119	.420	.469
October	30,100	3,780	11,260	1.15	1.33
November	8,850	4,800	5,972	.609	.679
December	47,850	2,200	7,660	.781	.900
The year	123,400	2,200	17,180	1.75	23.76

SUSQUEHANNA RIVER AT DANVILLE, PA.

This station, 52 miles below Wilkesbarre and 11 miles above the mouth of the West Branch, was established on March 25, 1899, by E. G. Paul. It is located at the Mill Street Bridge, 600 feet south of the public square, Danville, Pa., near the Pennsylvania Railroad station at South Danville. The box of the standard chain gage is bolted to the hand rail on the lower side of the bridge 200 feet from the right bank. The length from the end of the weight to the marker is 42.85 feet. The gage is read once each day by E. F. Bell. Discharge measurements were made from the lower side of the Mill street covered wooden highway bridge. This bridge was carried away by the ice on March 9, 1904. From that time until the water dropped below gage height, 5 feet, its stage was observed on the Weather Bureau gage. After the water fell below 5 feet its stage was measured approximately, until September 30, 1904, by means of temporary gages set by the gage reader. This bridge had a total span of about 1,300 feet. The initial point for soundings was at the end of the wooden hand rail on the left bank, downstream side. The channel is straight for about one-half mile above and below the station. The right bank is low and liable to overflow. The left bank is high and is not subject to overflow. The bed of the stream is rocky, with some gravel, and is permanent. There is but one channel, broken by the six bridge piers, which do not obstruct the flow to any considerable extent. The current is moderately rapid, except at very low stages, when it becomes sluggish. The bench mark is the extreme south end of the stone doorsill at the east entrance to the city filter plant. Its elevation is 31.7 feet above gage datum.

Discharge measurements of Susquehanna River at Danville, Pa., 1899–1903.

Date.	Hydrographer.	Gage height.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Sq. feet.*	*Feet per second.*	*Second-feet.*
1899.					
Mar. 25	E. G. Paul	10.00	10,971	4.34	47,646
June 8	.....do	3.00	2,235	1.76	3,927
July 27	.....do	2.40	1,607	1.41	2,272
Sept. 16	.....do	2.00	1,265	1.13	1,427
Oct. 17	.....do	1.90	1,123	1.03	1,163
1900.					
May 20	E. G. Paul	4.60	3,799	2.76	10,515
Sept. 25	.....do	1.60	798	1.03	822
1901.					
Aug. 19	E. G. Paul	7.50	7,631	3.63	27,714
Oct. 27	.....do	3.10	2,051	2.20	4,510
1902.					
Apr. 22	E. G. Paul	5.20	4,541	3.17	14,393
Sept. 19	.....do	2.75	1,993	1.56	3,115
1903.					
Mar. 5	E. C. Murphy	9.82	10,413	3.72	39,600
Apr. 9	.....do	8.60	8,848	3.66	33,000
May 9	.....do	3.44	2,688	1.85	4,963
Oct. 8	W. C. Sawyer	3.46	2,845	2.01	5,728

Mean daily gage height, in feet, of Susquehanna River at Danville, Pa., 1899–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	------	------	------	6.95	4.80	3.30	3.20	2.20	2.80	2.10	2.10	3.10
2	------	------	------	6.80	4.65	3.40	3.00	2.20	2.60	2.10	2.60	3.00
3	------	------	------	6.35	4.60	3.70	2.80	2.60	2.50	2.10	2.60	3.00
4	------	------	------	6.00	4.60	3.60	2.70	2.30	2.50	2.10	6.10	3.00
5	------	------	------	5.65	4.60	3.50	2.60	2.20	2.30	2.00	5.40	3.00
6	------	------	------	5.50	4.55	3.30	2.60	2.20	2.20	2.00	5.70	2.90
7	------	------	------	5.65	4.35	3.20	2.60	2.50	2.20	2.00	5.20	3.10
8	------	------	------	6.90	4.15	3.00	2.50	2.30	2.10	2.00	4.70	3.10
9	------	------	------	10.50	3.80	3.00	2.50	2.20	2.40	2.10	4.30	3.10
10	------	------	------	11.60	3.70	2.90	2.50	2.20	2.20	2.10	3.90	3.00
11	------	------	------	10.45	3.70	2.90	2.50	2.60	2.10	2.00	7.30	3.00
12	------	------	------	9.15	3.75	2.90	2.40	2.30	2.20	2.00	3.90	3.10
13	------	------	------	8.95	3.80	2.70	2.60	2.40	2.10	2.00	3.70	4.20
14	------	------	------	10.75	3.70	2.70	2.70	2.30	2.10	1.90	4.00	6.80
15	------	------	------	11.55	3.70	2.60	2.60	2.30	2.10	1.90	3.90	7.80
16	------	------	------	11.40	3.60	2.60	2.80	2.30	2.00	1.90	3.80	7.60
17	------	------	------	10.85	3.60	2.60	2.80	2.30	1.90	1.90	3.90	6.70
18	------	------	------	10.05	3.70	2.60	2.70	2.30	1.90	1.90	4.30	6.10
19	------	------	------	9.05	3.60	2.60	2.70	2.30	1.80	1.90	4.40	5.70
20	------	------	------	8.25	3.60	2.50	2.50	2.20	1.80	1.90	4.30	5.40
21	------	------	------	7.75	3.60	2.50	2.50	2.10	1.90	1.90	4.10	5.60
22	------	------	------	7.35	3.80	2.50	2.50	2.10	1.90	1.90	3.80	6.90
23	------	------	------	7.05	3.80	2.50	2.50	2.10	1.80	1.90	3.90	6.30
24	------	------	------	6.65	3.80	2.50	2.50	2.10	1.80	1.90	3.60	6.30
25	------	------	10.00	6.20	3.80	2.50	2.50	2.00	1.80	1.90	3.40	6.50
26	------	------	9.25	5.85	3.70	2.70	2.40	2.00	1.90	1.90	3.40	7.10
27	------	------	8.10	5.70	3.60	2.60	2.40	2.00	1.90	1.90	3.30	6.90
28	------	------	7.35	5.65	3.50	2.60	2.40	2.30	1.80	1.80	3.20	6.40
29	------	------	7.30	5.35	3.30	2.90	2.40	2.20	1.90	1.90	3.10	5.80
30	------	------	7.55	5.10	3.20	3.20	2.40	3.50	2.10	1.90	3.10	5.00
31	------	------	7.45	------	3.30	------	2.30	3.20	------	1.90	------	------
1900.												
1	(a)	(a)	7.55	5.60	5.35	3.00	2.30	2.40	2.20	1.70	2.00	8.75
2	(a)	(a)	15.25	5.80	5.05	2.90	2.30	2.40	2.20	1.70	2.00	7.15
3	(a)	(a)	13.10	6.75	4.80	2.90	2.30	2.30	2.20	1.70	2.00	5.90
4	(a)	(a)	10.65	8.40	4.55	3.50	2.20	2.20	2.20	1.70	2.00	5.50
5	(a)	(a)	9.25	9.30	4.40	3.30	2.20	2.20	2.20	1.70	2.00	7.10
6	(a)	(a)	7.10	8.45	4.25	3.10	2.30	2.10	2.10	1.70	2.00	8.80
7	(a)	(a)	7.10	7.40	4.15	3.00	2.70	2.50	2.10	1.70	2.00	9.65
8	(a)	(a)	7.30	8.70	4.05	2.90	2.90	2.20	2.00	1.70	2.00	8.55
9	(a)	9.70	6.85	9.75	4.00	2.90	2.90	2.10	1.80	1.70	2.00	7.50
10	(a)	9.90	6.75	9.45	3.95	2.90	2.70	2.10	1.90	1.70	2.00	6.85
11	(a)	7.60	7.50	8.25	3.85	3.10	2.50	2.00	1.80	1.70	2.10	6.30
12	(a)	7.80	7.20	7.10	3.90	3.10	2.50	2.00	1.80	1.70	2.10	5.55
13	(a)	9.40	6.40	6.30	4.10	3.30	2.40	1.90	1.80	1.70	2.20	5.20
14	(a)	9.60	5.65	6.10	4.20	3.30	2.30	2.00	1.80	1.70	2.40	5.00
15	(a)	11.20	5.20	6.30	4.00	3.90	2.30	2.00	1.80	1.80	2.40	5.00
16	(a)	10.40	4.90	6.65	4.00	3.50	2.30	1.90	1.80	1.80	2.60	6.80
17	(a)	8.30	4.70	6.35	3.80	3.20	2.30	1.90	1.70	1.80	2.50	(a)
18	(a)	7.30	4.90	7.00	3.90	3.00	2.30	1.90	1.70	1.80	2.50	(a)
19	(a)	5.70	5.05	9.75	3.90	3.00	2.30	1.80	1.70	1.80	2.50	(a)
20	(a)	5.00	5.10	10.55	4.40	2.90	2.30	1.80	1.70	1.80	2.50	(a)
21	9.40	4.70	7.95	9.85	4.40	2.80	2.20	1.90	1.70	1.70	2.50	(a)
22	12.70	5.95	8.80	8.95	4.10	2.70	2.40	1.90	1.70	1.70	2.50	(a)
23	11.95	12.15	7.95	8.10	3.90	2.60	2.30	1.80	1.60	1.90	2.60	(a)
24	9.70	13.50	7.40	8.35	3.70	2.60	2.20	1.80	1.60	2.10	2.70	(a)
25	7.80	11.05	7.40	9.30	3.60	2.70	2.10	2.30	1.60	2.30	2.90	(a)
26	6.80	8.95	7.65	8.40	3.60	2.60	2.30	2.10	1.70	2.20	3.90	7.05
27	6.45	6.85	6.95	7.40	3.40	2.50	3.00	2.20	1.70	2.10	8.45	8.60
28	6.30	5.45	6.50	6.65	3.20	2.50	2.80	2.10	1.70	2.10	16.60	7.55
29	5.80	------	5.85	6.10	3.20	2.40	2.60	2.00	1.70	2.10	12.65	6.95
30	5.80	------	5.90	5.65	3.10	2.40	2.40	2.00	1.70	2.00	10.20	6.55
31	(a)	------	5.65	------	3.00	------	2.40	2.00	------	2.00	------	6.30

[a] River frozen.

Mean daily gage height, in feet, of Susquehanna River at Danville, Pa., 1899–1904—Continued.

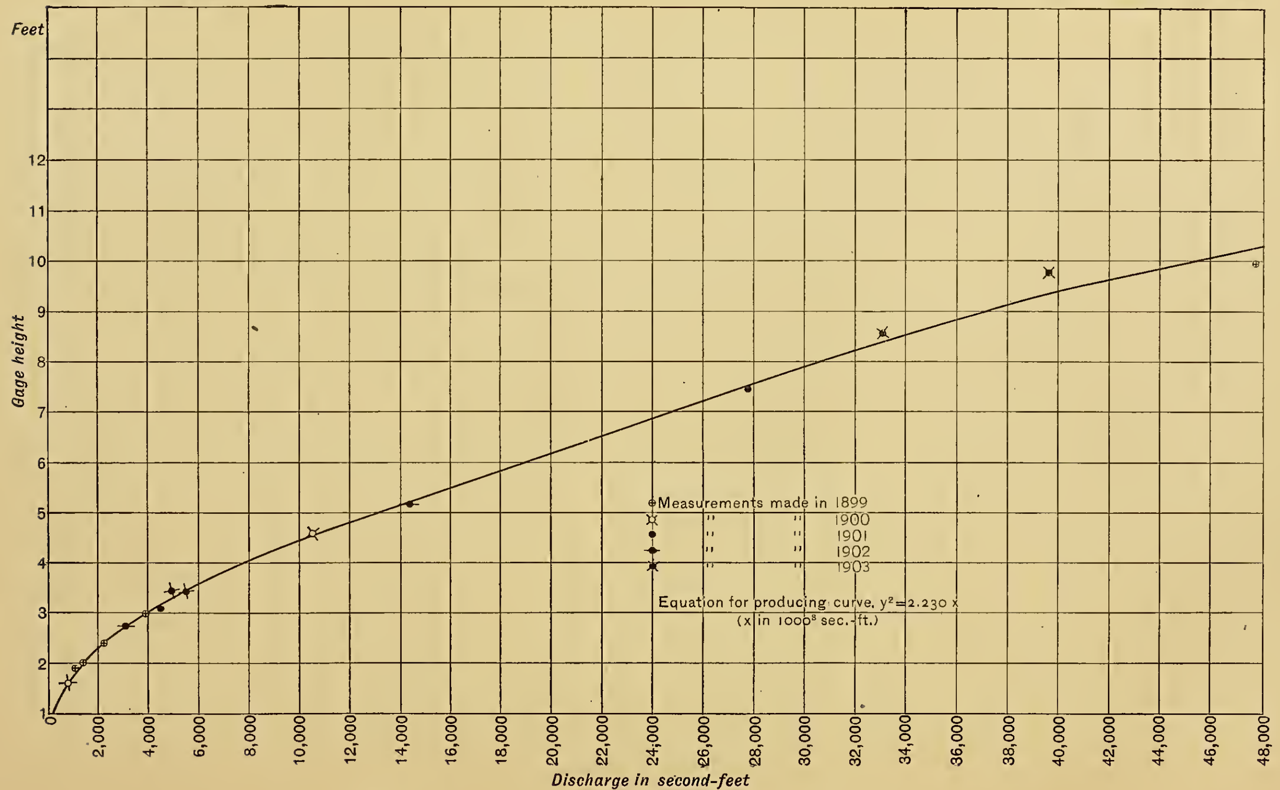
Days.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	5.70	(a)	(a)	8.50	6.65	13.60	3.70	3.30	4.60	3.50	2.90	4.10
2	8.60	(a)	(a)	7.65	6.10	9.05	3.70	3.00	5.10	3.50	2.90	3.90
3	(a)	(a)	(a)	7.20	6.50	9.65	3.40	2.70	4.90	3.85	2.80	3.90
4	(a)	(a)	(a)	7.60	7.60	9.15	3.20	2.60	4.90	4.05	2.80	4.55
5	(a)	(a)	(a)	8.65	7.35	8.30	3.10	2.60	4.30	3.85	2.80	5.95
6	(a)	(a)	(a)	9.40	6.65	7.30	3.10	2.60	4.25	3.70	2.70	7.90
7	(a)	(a)	(a)	8.60	6.05	6.80	3.10	2.70	3.95	3.50	2.70	[b]8.30
8	(a)	(a)	(a)	8.55	5.35	7.30	3.60	2.90	3.70	3.30	2.60	[b]8.70
9	(a)	(a)	(a)	7.80	5.30	7.60	3.50	3.10	3.50	3.20	2.60	[b]9.10
10	(a)	(a)	(a)	7.45	6.50	7.55	3.40	2.90	3.35	3.20	2.60	9.55
11	(a)	(a)	(a)	7.10	5.00	7.00	3.30	3.50	3.25	3.10	2.60	9.80
12	(a)	(a)	12.00	6.75	5.70	6.40	3.30	3.30	3.10	3.00	2.60	10.05
13	(a)	(a)	11.15	6.50	6.60	5.60	3.20	3.00	3.00	2.90	2.80	8.90
14	(a)	(a)	8.50	8.60	7.95	5.20	3.10	2.90	3.05	3.90	2.90	7.90
15	(a)	(a)	7.60	8.15	7.85	5.00	3.00	2.80	3.00	3.85	3.00	14.65
16	(a)	(a)	7.30	7.80	7.05	4.95	2.90	2.80	3.10	3.90	3.45	22.57
17	(a)	(a)	7.40	7.45	6.30	4.60	2.90	2.80	3.10	3.90	3.90	20.05
18	(a)	(a)	6.90	7.10	5.80	4.60	3.00	6.60	3.40	3.90	3.90	13.85
19	(a)	(a)	6.60	6.75	5.80	4.45	3.10	7.85	3.50	3.80	3.60	10.25
20	(a)	(a)	6.60	6.50	5.70	4.10	3.00	5.60	3.50	3.90	3.50	8.30
21	(a)	(a)	9.25	6.90	5.95	4.00	2.90	4.55	3.60	3.60	3.50	7.10
22	(a)	(a)	11.85	12.60	5.75	3.90	2.80	4.75	3.60	3.50	3.50	5.90
23	(a)	(a)	12.70	15.25	5.35	3.90	2.70	6.30	3.40	3.40	3.40	5.10
24	(a)	(a)	11.35	12.75	5.40	4.25	2.60	8.10	3.40	3.30	3.40	4.90
25	(a)	(a)	11.25	12.05	6.55	5.35	2.60	11.02	3.10	3.30	3.70	4.75
26	(a)	(a)	11.15	11.70	7.40	4.70	2.60	9.25	3.00	3.20	6.17	4.95
27	(a)	(a)	13.35	10.65	6.90	4.45	2.60	7.55	2.90	3.10	7.00	5.10
28	(a)	(a)	17.00	8.90	6.40	4.10	2.60	6.15	2.80	3.10	5.85	5.00
29	(a)	......	16.85	8.25	8.00	3.85	2.50	5.35	2.90	3.00	4.95	5.20
20	(a)	......	13.35	7.35	12.70	3.80	2.70	4.70	3.20	3.00	4.35	7.15
31	(a)	......	10.45	......	14.95	......	2.90	4.40	......	2.90	......	6.80
1902.												
1	6.60	4.85	20.67	7.85	4.40	3.50	6.10	7.70	3.10	8.95	7.05	4.30
2	6.20	5.05	24.43	7.60	4.30	3.40	8.95	7.75	3.00	9.15	6.30	4.20
3	5.40	(c)	26.07	7.40	4.20	3.30	7.40	8.70	3.00	9.05	5.80	4.20
4	5.50	......	22.25	7.10	4.20	3.30	6.90	8.20	2.90	7.65	5.45	4.60
5	6.70	......	18.20	6.65	4.20	3.30	6.90	7.20	2.90	6.75	5.20	4.70
6	(c)	......	14.50	6.45	4.10	3.20	6.90	6.75	2.80	6.80	5.00	4.90
7	......	......	10.75	6.30	4.00	3.20	8.50	5.85	2.80	6.50	4.85	4.90
8	......	......	8.55	6.50	4.00	3.90	11.90	5.45	2.80	6.10	4.70	4.80
9	10.60	......	8.35	7.30	3.90	3.70	10.45	5.20	2.70	5.60	4.70	4.70
10	9.45	......	9.10	11.90	3.80	3.50	7.85	5.00	2.90	5.20	4.50	4.30
11	9.10	......	10.25	13.10	3.80	3.50	7.25	4.70	3.00	4.90	4.30	4.20
12	9.30	......	11.55	11.20	3.70	3.60	7.80	4.60	3.10	5.40	4.20	4.30
13	(c)	......	14.15	9.75	3.60	3.50	7.90	4.50	3.00	6.00	4.10	4.40
14	......	......	16.15	8.65	3.50	3.50	7.20	4 50	3.10	5.60	4.00	5.00
15	......	......	15.55	7.70	3.50	3.60	5.55	4.40	3.10	5.25	3.90	6.50
16	......	......	13.95	7.05	3.40	3.60	5.15	4.30	3.00	5.10	3.90	7.80
17	......	......	14.25	6.60	3.30	3.70	4.85	4.10	2.90	5.10	3.90	9.40
18	......	......	16.60	6.35	3.30	4.10	4.60	3.80	2.80	5.00	3.80	10.30
19	......	......	15.60	6.15	3.20	4.00	4.40	3.70	2.70	4.70	3.70	10.60
20	......	......	12.80	5.90	3.10	3.80	4.40	3.60	2.60	4.50	3.60	9.40
21	......	......	10.95	5.45	3.10	3.80	5.30	3.50	2.60	4.20	3.60	8.80
22	......	......	8.90	5.30	3.10	3.70	11.90	3.50	2.60	4.10	3.60	12.70
23	8.10	......	8.00	5.10	3.00	3.60	12.00	3.40	2.60	4.20	3.50	14.80
24	9.45	......	6.40	4.90	3.00	3.50	11.30	3.40	2.50	4.30	3.50	14.40
25	8.50	......	7.20	4.70	3.20	3.50	10.90	3.40	2.60	4.20	3.50	11.80
26	7.40	......	7.10	4.50	3.30	3.60	11.90	3.30	4.75	4.00	3.60	9.75
27	6.90	......	7.05	4.30	3.20	3.70	10.20	3.20	6.85	5.60	3.80	8.40
28	6.75	13.75	6.65	4.10	3.30	3.70	8.30	3.20	6.20	8.90	3.90	7.60
29	6.40	......	6.75	4.00	3.50	3.50	8.00	3.20	6.05	9.70	4.00	6.80
30	6.20	......	8.15	4.30	3.80	4.20	9.30	3.10	7.95	9.35	4.20	6.30
31	5.55	......	8.30	......	3.70	......	8.20	3.10	......	8.20	......	5.70

[a] Ice.
[b] Estimated.
[c] Frozen from January 6 to 8, 13 to 21, February 3 to 27.

Mean daily gage height, in feet, of Susquehanna River at Danville, Pa., 1899–1904—Cont'd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	5.20	[a]13.80	16.40	8.50	4.10	2.70	6.50	4.10	11.60	3.00	4.80	4.00
2	5.20	[a]12.40	17.60	9.80	4.00	2.60	6.00	3.90	9.85	2.90	4.60	4.60
3	6.10	[a]10.20	14.40	8.90	3.80	2.60	5.55	3.90	8.00	2.90	4.50	5.10
4	6.60	[a]11.20	11.60	7.80	3.70	2.60	5.30	3.70	6.90	2.90	4.40	4.60
5	7.30	[a]14.00	9.60	7.60	3.70	2.50	5.00	4.15	6.05	2.90	4.30	4.00
6	8.20	[a]15.20	8.70	8.30	3.60	2.50	4.70	4.85	5.60	3.00	4.10	3.90
7	7.40	[a]11.80	9.20	7.60	3.50	2.50	4.70	6.70	5.10	3.00	4.10	4.40
8	6.60	[a]9.70	9.60	7.20	3.50	2.80	6.50	6.45	4.90	3.40	4.20	4.50
9	6.00	[a]7.80	10.40	8.80	3.40	2.90	5.30	6.00	4.50	4.70	4.30	4.00
10	5.70	[a]7.00	15.00	9.30	3.30	2.80	4.60	5.60	4.30	12.50	4.30	4.40
11	[a]9.40	[a]7.20	14.50	8.80	3.30	2.70	4.00	5.00	4.20	16.60	4.10	5.10
12	(b)	[a]7.10	15.00	7.90	3.20	3.40	4.00	4.90	4.30	17.00	4.00	(c)
13	(b)	[a]7.40	14.80	7.70	3.10	3.10	3.90	4.60	4.30	15.40	3.80	(c)
14	(b)	[a]8.50	12.80	7.30	3.10	5.00	3.60	4.70	4.70	11.60	3.80	(c)
15	(b)	[a]8.80	11.40	8.10	3.10	5.90	3.50	4.30	4.30	8.95	3.70	(c)
16	(b)	[a]8.10	9.60	11.35	3.10	5.65	3.40	4.30	4.00	7.60	3.90	(c)
17	(b)	[a]7.00	8.70	11.05	3.00	5.00	3.30	4.10	3.80	6.80	3.90	(c)
18	(b)	[a]6.60	7.60	9.05	3.00	4.60	3.20	3.90	4.30	7.50	7.75	(c)
19	(b)	[a]5.70	7.60	7.30	3.00	4.25	3.90	3.70	4.30	9.00	10.10	(c)
20	(b)	[a]6.00	7.40	7.10	2.90	4.15	4.50	3.50	3.90	10.20	7.80	(c)
21	(b)	(b)	7.00	6.40	2.90	4.00	4.40	3.50	4.10	9.40	7.50	(c)
22	(b)	(b)	6.80	5.90	2.90	4.30	4.50	3.85	3.90	8.20	6.80	(c)
23	(b)	(b)	8.00	5.50	3.00	6.40	4.40	4.50	3.80	7.20	5.80	(c)
24	(b)	(b)	15.85	5.30	3.00	6.95	4.10	4.20	3.70	6.50	5.50	(c)
25	(b)	(b)	18.05	5.00	2.90	7.75	3.80	3.90	3.40	6.00	5.20	(c)
26	(b)	(b)	15.25	4.80	2.90	7.80	5.30	3.70	3.30	5.60	5.00	(c)
27	(b)	(b)	12.80	4.70	2.80	8.55	4.90	3.50	3.20	5.40	4.80	(c)
28	(b)	10.85	10.70	4.50	2.70	6.90	4.10	3.70	3.20	5.20	4.70	(c)
29	(b)	-------	9.30	4.40	2.80	6.80	3.80	5.15	3.20	5.00	4.30	(c)
30	(b)	-------	8.30	4.20	2.80	7.30	3.80	10.73	3.00	4.80	4.20	(c)
31	[a]14.80	-------	7.80	-------	2.70	-------	3.80	14.65	-------	4.80	-------	(c)
1904.[k]												
1	(c)	14.70	11.40	11.05	8.10	4.00	2.00	2.40	1.90	------	------	------
2	(c)	14.10	11.30	10.85	8.00	4.20	2.00	2.50	1.90	------	------	------
3	(c)	13.30	11.80	10.60	7.50	4.70	1.90	2.50	1.80	------	------	------
4	(c)	12.70	[i]12.90	10.40	6.40	4.20	1.90	2.70	1.70	------	------	------
5	(c)	12.10	13.80	10.40	5.30	4.70	1.80	2.90	1.70	------	------	------
6	(c)	11.70	16.00	9.70	4.20	5.10	2.40	2.50	1.60	------	------	------
7	(c)	11.50	17.25	9.30	3.70	5.50	2.30	2.40	1.50	------	------	------
8	(c)	13.10	19.95	8.80	3.60	4.70	2.10	2.70	1.50	------	------	------
9	(c)	[f]20.00	[j]24.00	8.20	3.60	4.30	2.10	2.90	1.40	------	------	------
10	(c)	[g]23.86	-------	7.90	3.40	4.90	2.00	2.40	1.40	------	------	------
11	(c)	21.25	-------	7.40	3.30	7.10	1.90	1.90	1.40	------	------	------
12	(c)	19.50	-------	6.80	3.30	6.20	1.90	1.70	1.30	------	------	------
13	(c)	18.05	-------	6.30	3.20	4.80	2.00	1.70	1.30	------	------	------
14	(c)	16.90	-------	6.10	3.10	4.70	2.40	1.60	1.60	------	------	------
15	(c)	15.40	-------	5.80	2.90	4.50	2.60	1.60	1.90	------	------	------
16	(c)	[h]13.90	-------	5.40	2.70	4.30	2.20	1.50	2.20	------	------	------
17	(c)	13.00	-------	5.00	3.90	4.00	1.90	1.40	1.90	------	------	------
18	(c)	12.40	-------	4.70	4.50	3.70	1.80	1.70	1.70	------	------	------
19	(c)	11.00	-------	4.30	6.30	3.30	1.80	1.60	1.60	------	------	------
20	(c)	10.60	-------	4.10	6.90	3.00	1.70	1.50	1.50	------	------	------
21	(c)	11.20	-------	4.00	7.20	2.80	1.70	1.50	1.50	------	------	------
22	(c)	12.30	-------	3.70	6.30	2.60	1.60	1.40	1.90	------	------	------
23	(c)	12.30	-------	3.50	4.90	2.60	1.90	1.40	2.40	------	------	------
24	[d]19.85	12.40	-------	3.30	4.40	2.50	2.00	1.80	2.90	------	------	------
25	[e]24.00	12.00	-------	3.30	4.10	2.50	1.80	2.40	2.30	------	------	------
26	23.25	11.70	-------	3.20	4.70	2.30	1.70	2.90	2.00	------	------	------
27	19.85	11.70	14.25	3.00	4.40	2.20	1.50	2.60	2.20	------	------	------
28	17.90	11.40	13.80	4.20	3.90	2.20	1.80	2.50	2.70	------	------	------
29	16.00	11.10	13.35	5.30	3.70	2.10	1.80	2.30	2.10	------	------	------
30	15.55	-------	12.55	6.90	3.70	2.10	2.00	2.00	2.40	------	------	------
31	15.05	-------	11.75	-------	3.90	-------	2.20	1.90	-------	------	------	------

[a] Water backed up by ice.
[b] River frozen.
[c] River frozen.
[d] The ice started at 11.30 a. m.
[e] The ice gorged 1 p. m.
[f] The river is still frozen over.
[g] The ice broke and gorged and left an open place by the bridge.
[h] The ice is still gorged in the river.
[i] The ice gorge is still in the river above and below town.
[j] The ice started at 4 o'clock and the water backed up to 29 feet.
[k] The gage heights for 1904 are somewhat uncertain, therefore no estimates of flow have been made.



RATING CURVE FOR SUSQUEHANNA RIVER AT DANVILLE, PA.

Rating table for Susquehanna River at Danville, Pa., for 1899 to 1904.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1.5	700	3.8	6,880	6.1	19,230	9.8	42,900
1.6	830	3.9	7,330	6.2	19,800	10.0	44,800
1.7	970	4.0	7,780	6.3	20,370	10.2	46,700
1.8	1,120	4.1	8,230	6.4	20,940	10.4	48,600
1.9	1,270	4.2	8,690	6.5	21,510	10.6	50,400
2.0	1,440	4.3	9,160	6.6	22,080	10.8	52,300
2.1	1,620	4.4	9,660	6.7	22,660	11.0	54,300
2.2	1,810	4.5	10,170	6.8	23,240	11.2	56,300
2.3	2,010	4.6	10,700	6.9	23,820	11.4	58,300
2.4	2,230	4.7	11,250	7.0	24,400	11.6	60,400
2.5	2,470	4.8	11,820	7.2	25,600	11.8	62,500
2.6	2,720	4.9	12,390	7.4	26,800	12.0	64,600
2.7	3,000	5.0	12,960	7.6	28,000	12.2	66,700
2.8	3,280	5.1	13,530	7.8	29,100	12.4	68,900
2.9	3,580	5.2	14,100	8.0	30,300	12.6	71,200
3.0	3,900	5.3	14,670	8.2	31,600	12.8	73,500
3.1	4,230	5.4	15,240	8.4	32,800	13.0	75,800
3.2	4,570	5.5	15,810	8.6	34,100	13.5	81,800
3.3	4,920	5.6	16,380	8.8	35,400	14.0	87,800
3.4	5,280	5.7	16,950	9.0	36,700	14.5	94,300
3.5	5,650	5.8	17,520	9.2	38,000	15.0	101,000
3.6	6,040	5.9	18,090	9.4	39,500		
3.7	6,450	6.0	18,660	9.6	41,100		

Mean daily discharge, in second-feet, of Susquehanna River at Danville, Pa., 1899–1903.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	......	......	......	24,110	11,820	4,920	4,570	1,810	3,280	1,620	1,620	4,230
2	......	......	......	23,240	10,920	5,280	3,900	1,810	2,720	1,620	2,720	3,900
3	......	......	......	20,660	10,700	6,450	3,280	2,720	2,470	1,620	2,720	3,900
4	......	......	......	18,660	10,700	6,040	3,000	2,010	2,470	1,620	19,230	3,900
5	......	......	......	16,660	10,700	5,650	2,720	1,810	2,010	1,440	15,240	3,900
6	......	......	......	15,810	10,440	4,920	2,720	1,810	1,810	1,440	16,950	3,580
7	......	......	......	16,660	9,410	4,570	2,720	2,470	1,810	1,440	14,100	4,230
8	......	......	......	23,820	8,460	3,900	2,470	2,010	1,620	1,440	11,250	4,230
9	......	......	......	49,500	6,880	3,900	2,470	1,810	2,230	1,620	9,160	4,230
10	......	......	......	60,400	6,450	3,580	2,470	1,810	1,810	1,620	7,330	3,900
11	......	......	......	49,000	6,450	3,580	2,470	2,720	1,620	1,440	6,450	3,900
12	......	......	......	37,600	6,660	3,580	2,230	2,010	1,810	1,440	7,330	4,230
13	......	......	......	36,400	6,880	3,000	2,720	2,230	1,620	1,440	6,450	8,690
14	......	......	......	51,800	6,450	3,000	3,000	2,010	1,620	1,270	7,780	23,240
15	......	......	......	59,800	6,450	2,720	2,720	2,010	1,620	1,270	7,330	29,100
16	......	......	......	58,300	6,040	2,720	3,280	2,010	1,440	1,270	6,880	28,000
17	......	......	......	52,800	6,040	2,720	3,280	2,010	1,270	1,270	7,330	22,660
18	......	......	......	45,250	6,450	2,720	3,000	2,010	1,270	1,270	9,160	19,230
19	......	......	......	37,000	6,040	2,720	3,000	2,010	1,120	1,270	9,660	16,950
20	......	......	......	31,900	6,040	2,470	2,470	1,810	1,120	1,270	9,160	15,240
21	......	......	......	28,800	6,040	2,470	2,470	1,620	1,270	1,270	8,230	16,380
22	......	......	......	26,500	6,880	2,470	2,470	1,620	1,270	1,270	6,880	23,820
23	......	......	......	24,700	6,880	2,470	2,470	1,620	1,120	1,270	7,330	20,370
24	......	......	......	22,370	6,880	2,470	2,470	1,620	1,120	1,270	6,040	20,370
25	......	......	44,800	19,800	6,880	2,470	2,470	1,440	1,120	1,270	5,280	21,510
26	......	......	38,350	17,800	6,450	3,000	2,230	1,440	1,270	1,270	5,280	25,000
27	......	......	31,000	16,950	6,040	2,720	2,230	1,440	1,270	1,270	4,920	23,820
28	......	......	26,500	16,660	5,650	2,720	2,230	2,010	1,120	1,120	4,570	20,940
29	......	......	26,200	14,950	4,920	3,580	2,230	1,810	1,270	1,270	4,230	17,520
30	......	......	27,700	13,530	4,570	4,570	2,230	5,650	1,620	1,270	4,230	12,960
31	......	......	27,100	......	4,920	......	2,010	4,570	......	1,270	......	......
1900.												
1	......	......	27,700	16,380	14,950	3,900	2,010	2,230	1,810	970	1,440	35,000
2	......	......	104,300	17,520	13,240	3,580	2,010	2,230	1,810	970	1,440	25,300
3	......	......	77,000	22,940	11,820	3,580	2,010	2,010	1,810	970	1,440	18,090
4	......	......	50,800	32,800	10,440	5,650	1,810	1,810	1,810	970	1,440	15,810
5	......	......	38,350	38,700	9,660	4,920	1,810	1,810	1,810	970	1,440	25,000
6	......	......	25,000	33,100	8,920	4,230	2,010	1,620	1,620	970	1,440	35,400
7	......	......	25,000	26,800	8,460	3,900	3,000	2,470	1,620	970	1,440	41,600
8	......	......	26,200	34,700	8,000	3,580	3,580	1,810	1,440	970	1,440	33,800
9	......	42,000	23,530	42,400	7,780	3,580	3,580	1,620	1,120	970	1,440	27,400
10	......	43,800	22,940	39,900	7,550	3,580	3,000	1,620	1,270	970	1,440	23,530
11	......	28,000	27,400	31,900	7,100	4,230	2,470	1,440	1,120	970	1,620	20,370
12	......	29,100	25,600	25,000	7,330	4,230	2,470	1,440	1,120	970	1,620	16,200
13	......	39,500	20,940	20,370	8,230	4,920	2,230	1,270	1,120	970	1,810	14,100
14	......	41,100	16,660	19,230	8,690	4,920	2,010	1,440	1,120	970	2,230	12,960
15	......	56,300	14,100	20,370	7,780	7,330	2,010	1,440	1,120	1,120	2,230	12,960
16	......	48,600	12,390	22,370	7,780	5,650	2,010	1,270	1,120	1,120	2,720	23,240
17	......	32,200	11,250	20,660	6,880	4,570	2,010	1,270	970	1,120	2,470	......
18	......	26,200	12,390	24,400	7,330	3,900	2,010	1,270	970	1,120	2,470	......
19	......	16,950	13,240	42,400	7,330	3,900	2,010	1,120	970	1,120	2,470	......
20	......	12,960	13,530	50,000	9,660	3,580	2,010	1,120	970	1,120	2,470	......
21	39,500	11,250	30,000	43,400	9,660	3,280	1,810	1,270	970	970	2,470	......
22	72,300	18,370	35,400	36,400	8,230	3,000	2,230	1,270	970	970	2,470	......
23	64,000	66,200	30,000	31,000	7,330	2,720	2,010	1,120	830	1,270	2,720	......
24	42,000	81,800	26,800	32,500	6,450	2,720	1,810	1,120	830	1,620	3,000	......
25	29,100	54,800	26,800	38,700	6,040	3,000	1,620	2,010	830	2,010	3,580	......
26	23,240	36,400	28,200	32,800	6,040	2,720	2,010	1,620	970	1,810	7,330	24,700
27	21,220	23,530	24,110	26,800	5,280	2,470	3,900	1,810	970	1,620	33,100	34,100
28	20,370	15,520	21,510	22,370	4,570	2,470	3,280	1,620	970	1,620	123,600	27,700
29	17,520	......	17,800	19,230	4,570	2,230	2,720	1,440	970	1,620	71,800	24,110
30	17,520	......	18,090	16,660	4,230	2,230	2,230	1,440	970	1,440	46,700	21,800
31	......	......	16,660	......	3,900	......	2,230	1,440	......	1,440	......	20,370

Mean daily discharge, in second-feet, of Susquehanna River at Danville, Pa., 1899–1903—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	16,950	-------	-------	33,400	22,370	83,000	6,450	4,920	10,700	5,650	3,580	8,230
2	34,100	-------	-------	28,200	19,230	37,000	6,450	3,900	13,530	5,650	3,580	7,330
3	-------	-------	-------	25,600	21,510	41,600	5,280	3,000	12,390	7,100	3,280	7,330
4	-------	-------	-------	28,000	28,000	37,600	4,570	2,720	12,390	8,000	3,280	10,440
5	-------	-------	-------	34,400	26,500	32,200	4,230	2,720	9,160	7,100	3,280	18,370
6	-------	-------	-------	39,500	22,370	26,200	4,230	2,720	8,920	6,450	3,000	29,700
7	-------	-------	-------	34,100	18,940	23,240	4,230	3,000	7,550	5,650	3,000	32,200
8	-------	-------	-------	33,800	14,950	26,200	6,040	3,580	6,450	4,920	2,720	34,700
9	-------	-------	-------	29,100	14,670	28,000	5,650	4,230	5,650	4,570	2,720	37,300
10	-------	-------	-------	27,100	21,510	27,700	5,280	3,580	5,100	4,570	2,720	40,700
11	-------	-------	-------	25,000	12,960	24,400	4,920	5,650	4,790	4,230	2,720	42,900
12	-------	-------	64,600	22,940	16,950	20,940	4,920	4,920	4,230	3,900	2,720	45,200
13	-------	-------	55,800	22,510	22,080	16,380	4,570	3,900	3,900	3,580	3,280	36,000
14	-------	-------	33,400	34,100	30,000	14,100	4,230	3,580	4,060	7,330	3,580	29,700
15	-------	-------	28,000	31,300	29,400	12,960	3,900	3,280	3,900	7,100	3,900	96,300
16	-------	-------	26,200	29,100	24,700	12,670	3,580	3,280	4,230	7,330	5,460	228,400
17	-------	-------	26,800	27,100	20,370	10,700	3,580	3,280	4,230	7,330	7,330	180,300
18	-------	-------	23,820	25,000	17,520	10,700	3,900	22,080	5,280	7,330	7,330	86,000
19	-------	-------	22,080	22,940	17,520	9,920	4,230	29,400	5,650	6,880	6,040	47,200
20	-------	-------	22,080	21,510	16,950	8,230	3,900	16,380	5,650	7,330	5,650	32,200
21	-------	-------	38,350	23,820	18,370	7,780	3,580	10,440	6,040	6,040	5,650	25,000
22	-------	-------	63,000	71,200	17,230	7,330	3,280	11,540	6,040	5,650	5,650	18,090
23	-------	-------	72,300	104,300	14,950	7,330	3,000	20,370	5,280	5,280	5,280	13,530
24	-------	-------	57,800	72,900	15,240	8,920	2,720	31,000	5,280	4,920	5,280	12,390
25	-------	-------	56,800	65,100	21,800	14,950	2,720	54,300	4,230	4,920	6,450	11,540
26	-------	-------	55,800	61,400	26,800	11,250	2,720	38,350	3,900	4,570	19,520	12,670
27	-------	-------	80,000	50,800	23,820	9,920	2,720	27,700	3,580	4,230	24,400	13,530
28	-------	-------	129,600	36,000	20,940	8,230	2,720	19,520	3,280	4,230	17,800	12,960
29	-------	-------	127,300	31,900	30,300	7,100	2,470	14,950	3,580	3,900	12,670	14,100
30	-------	-------	80,000	26,500	72,300	6,880	3,000	11,250	4,570	3,900	9,410	25,300
31	-------	-------	49,000	-------	100,300	-------	3,580	9,660	-------	3,580	-------	23,240
1902.												
1	22,080	12,100	191,600	29,400	9,660	5,650	19,230	28,500	4,230	36,400	24,700	9,160
2	19,800	13,240	267,600	28,000	9,160	5,280	36,400	28,800	3,900	37,600	20,370	8,690
3	15,240	-------	304,800	26,800	8,690	4,920	26,800	34,700	3,900	37,000	17,520	8,690
4	15,810	-------	222,000	25,000	8,690	4,920	23,820	31,600	3,580	28,200	15,520	10,700
5	22,660	-------	148,500	22,370	8,690	4,920	23,820	25,600	3,580	22,940	14,100	11,250
6	-------	-------	94,300	21,220	8,230	4,570	23,820	22,940	3,280	23,240	12,960	12,390
7	-------	-------	51,800	20,370	7,780	4,570	33,400	17,800	3,280	21,510	12,100	12,390
8	-------	-------	33,800	21,510	7,780	7,330	63,500	15,520	3,280	19,230	11,250	11,820
9	50,400	-------	32,500	26,200	7,330	6,450	49,000	14,100	3,000	16,380	11,250	11,250
10	39,900	-------	37,300	63,500	6,880	5,650	29,400	12,960	3,580	14,100	10,170	9,160
11	37,300	-------	47,200	77,000	6,880	5,650	25,900	11,250	3,900	12,390	9,160	8,690
12	38,700	-------	59,800	56,300	6,450	6,040	29,100	10,700	4,230	15,240	8,690	9,160
13	-------	-------	89,600	42,400	6,040	5,650	29,700	10,170	3,900	18,660	8,230	9,660
14	-------	-------	117,000	34,400	5,650	5,650	25,600	10,170	4,230	16,380	7,780	12,960
15	-------	-------	108,400	28,500	5,650	6,040	16,200	9,660	4,230	14,380	7,330	21,510
16	-------	-------	87,200	24,700	5,280	6,040	13,810	9,160	3,900	13,530	7,330	29,100
17	-------	-------	91,000	22,080	4,920	6,450	12,100	8,230	3,580	13,530	7,330	39,500
18	-------	-------	123,600	20,660	4,920	8,230	10,700	6,880	3,280	12,960	6,880	47,600
19	-------	-------	109,100	19,520	4,570	7,780	9,660	6,450	3,000	11,250	6,450	50,400
20	-------	-------	73,500	18,090	4,230	6,880	9,660	6,040	2,720	10,170	6,040	39,500
21	-------	-------	53,800	15,520	4,230	6,880	14,670	5,650	2,720	8,690	6,040	35,400
22	-------	-------	36,000	14,670	4,230	6,450	63,500	5,650	2,720	8,230	6,040	72,300
23	31,000	-------	30,300	13,530	3,900	6,040	64,600	5,280	2,720	8,690	5,650	98,300
24	39,900	-------	20,940	12,390	3,900	5,650	57,300	5,280	2,470	9,160	5,650	93,000
25	33,400	-------	25,600	11,250	4,570	5,650	53,300	5,280	2,720	8,690	5,650	62,500
26	26,800	-------	25,000	10,170	4,920	6,040	63,500	4,920	11,540	7,780	6,040	42,400
27	23,820	-------	24,700	9,160	4,570	6,450	46,700	4,570	23,530	16,380	6,880	32,800
28	22,940	84,800	22,370	8,230	4,920	6,450	32,200	4,570	19,800	36,000	7,330	28,000
29	20,940	-------	22,940	7,780	5,650	5,650	30,300	4,570	18,940	42,000	7,780	23,240
30	19,800	-------	31,300	9,160	6,880	8,690	38,700	4,230	30,000	39,100	8,690	20,370
31	16,200	-------	32,200	-------	6,450	-------	31,600	4,230	-------	31,600	-------	16,950

Mean daily discharge, in second-feet, of Susquehanna River at Danville, Pa., 1899–1903—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	......	85,400	120,600	33,400	8,230	3,000	21,510	8,230	60,400	3,900	11,820	7,780
2	......	68,900	138,900	42,900	7,780	2,720	18,660	7,330	43,400	3,580	10,700	10,700
3	......	46,700	93,000	36,000	6,880	2,720	16,200	7,330	30,300	3,580	10,170	13,530
4	22,080	56,300	60,400	29,100	6,450	2,720	14,670	6,450	23,820	3,580	9,660	10,700
5	26,200	87,800	41,100	28,000	6,450	2,470	12,960	8,460	18,940	3,580	9,160	7,780
6	31,600	103,600	34,700	32,200	6,040	2,470	11,250	12,100	16,380	3,900	8,230	......
7	26,800	62,500	38,000	28,000	5,650	2,470	11,250	22,660	13,530	3,900	8,230	......
8	22,080	42,000	41,100	25,600	5,650	3,280	21,510	21,220	12,390	5,280	8,690	......
9	18,660	29,100	48,600	35,400	5,280	3,580	14,670	18,660	10,170	11,250	9,160	......
10	16,950	24,400	101,000	38,700	4,920	3,280	10,700	16,380	9,160	70,000	9,160	......
11	39,500	25,600	94,300	35,400	4,920	3,000	7,780	12,960	8,690	123,600	8,230	......
12	......	25,000	101,000	29,700	4,570	5,280	7,780	12,390	9,160	129,600	7,780	......
13	......	26,800	98,300	28,500	4,230	8,230	7,330	10,700	9,160	106,300	6,880	......
14	......	33,400	73,500	26,200	4,230	12,960	6,040	11,250	11,250	60,400	6,880	......
15	......	35,400	58,300	31,000	4,230	18,090	5,650	9,160	9,160	36,400	6,450	......
16	......	31,000	41,100	57,800	4,230	16,660	5,280	9,160	7,780	28,000	7,330	......
17	......	24,400	34,700	54,800	3,900	12,960	4,920	8,230	6,880	23,240	7,330	......
18	......	22,080	28,000	37,000	3,900	10,700	4,570	7,330	9,160	27,400	28,800	......
19	......	16,950	28,000	26,200	3,900	8,920	7,330	6,450	9,160	36,700	45,700	......
20	......	18,660	26,800	25,000	3,580	8,460	10,170	5,650	7,330	46,700	29,100	......
21	......	......	24,400	20,940	3,580	7,780	9,660	5,650	8,230	39,500	27,400	......
22	......	......	23,240	18,090	3,580	9,160	10,170	7,100	7,330	31,600	23,240	......
23	......	......	30,300	15,810	3,900	20,940	9,660	10,170	6,880	25,600	17,520	......
24	......	......	112,700	14,670	3,900	24,110	8,230	8,690	6,450	21,510	15,810	......
25	......	......	146,100	12,960	3,580	28,800	6,880	7,330	5,280	18,660	14,100	......
26	......	......	104,300	11,820	3,580	29,100	14,670	6,450	4,920	16,380	12,960	......
27	......	......	73,500	11,250	3,280	33,800	12,390	5,650	4,570	15,240	11,820	......
28	......	52,800	51,300	10,170	3,000	23,820	8,230	6,450	4,570	14,100	11,250	......
29	......	......	38,700	9,660	3,280	23,240	6,880	13,810	4,570	12,960	9,160	......
30	......	......	32,200	8,690	3,280	26,200	6,880	51,800	3,900	11,820	8,690	......
31	98,300	......	29,100	......	3,000	......	6,880	96,300	......	11,820	......	......

Estimated monthly discharge of Susquehanna River at Danville, Pa., 1899–1903.

[Drainage area, 11,070 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1899.					
March (25–31)	44,800	26,200	31,663	2.860	0.744
April	60,400	13,530	31,048	2.804	3.128
May	11,820	4,570	7,293	.659	.760
June	6,450	2,470	3,579	.323	.360
July	4,570	2,010	2,710	.245	.282
August	5,650	1,440	2,121	.192	.221
September	3,280	1,120	1,940	.175	.195
October	1,620	1,120	1,371	.124	.143
November	19,230	1,620	7,828	.707	.789
December (1–30)	29,100	3,580	13,798	1.246	1.390
The period	60,400	1,120	10,335	.934	8.012

Estimated monthly discharge of Susquehanna River at Danville, Pa., 1899–1903.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1900.					
January (21–31) [a]	72,300	17,520	34,677	3.132	1.165
February (9–28) [a]	81,800	11,250	36,229	3.273	2.434
March	104,300	11,250	27,861	2.517	2.902
April	50,000	16,380	29,393	2.655	2.962
May	14,950	3,900	7,911	.715	.824
June	7,330	2,230	3,819	.345	.385
July	3,900	1,620	2,320	.210	.242
August	2,470	1,120	1,564	.141	.162
September	1,810	830	1,200	.108	.120
October	2,010	970	1,184	.107	.123
November	123,600	1,440	11,109	1.004	1.120
December (1–16 and 26–31) [a]	41,600	12,960	24,252	2.191	1.793
The year	123,600	830	15,127	1.366	13.989
1901.					
January (1–2) [a]	34,100	16,950	25,525	2.306	0.172
February [a]					
March (12–31) [a]	129,600	22,080	55,636	5.026	3.735
April	104,300	21,510	37,287	3.368	3.758
May	100,300	12,960	25,179	2.274	2.622
June	83,000	6,880	19,781	1.787	1.994
July	6,450	2,470	4,085	.369	.425
August	54,300	2,720	12,232	1.105	1.274
September	13,530	3,280	6,118	.553	.617
October	8,000	3,580	5,588	.505	.582
November	24,400	2,720	6,376	.576	.643
December	228,400	7,330	39,769	3.592	4.141
The year	228,400	2,470	19,798	1.788	19.963

[a] River frozen, for days not included.

Estimated monthly discharge of Susquehanna River at Danville, Pa., 1899–1903—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1902.					
January (1–5, 9–12, 23–31)[a]	50,400	15,240	27,594	2.493	1.669
February (1–2, 28)[a]	84,800	12,100	36,713	3.316	.370
March	304,800	20,940	84,379	7.622	8.787
April	77,000	7,780	24,663	2.228	2.486
May	9,660	3,900	6,184	.559	.644
June	8,690	4,570	6,087	.550	.614
July	64,600	9,660	32,516	2.937	3.386
August	34,700	4,230	12,112	1.094	1.261
September	30,000	2,470	6,325	.571	.637
October	42,000	7,780	19,723	1.782	2.054
November	24,700	5,650	9,697	.876	.977
December	98,300	8,690	28,995	2.619	3.019
The year	304,800	2,470	24,582	2.221	25.904
1903.					
January (4–11, 31)[a]	98,300	16,950	33,574	3.033	1.015
February (1–20, 28)[a]	103,600	16,950	43,752	3.952	3.086
March	146,100	23,240	63,459	5.732	6.608
April	57,800	8,690	27,165	2.454	2.738
May	8,230	3,000	4,612	.417	.481
June	33,800	2,470	12,031	1.087	1.213
July	21,510	4,570	10,347	.935	1.081
August	96,300	5,650	14,242	1.286	1.483
September	60,400	3,900	12,764	1.153	1.286
October	129,600	3,580	30,648	2.768	3.191
November	45,700	6,450	13,380	1.209	1.349
December (1–5)	13,500	7,780	10,098	.912	.170
The year	146,100	2,470	23,006	2.078	23.701

[a] River frozen, for days not included.

WEST BRANCH OF SUSQUEHANNA RIVER AT WILLIAMSPORT, PA.

This station was established March 1, 1895, by George D. Snyder, who was at that time city engineer. On August 16, 1901, a standard chain gage was installed on the upper side of the Market Street Bridge. It is read once each day by Henry H. Guise, who is employed in the city engineer's office. The length of the chain from the end of the weight to the marker is 40.29 feet. Discharge measurements are made from the lower side of the Market street iron highway bridge. The initial point for soundings is the face of the abutment on the left bank. The channel is straight for several hundred feet above and below the station, is broken by four bridge piers, and is about 1,000 feet wide at the station. There is a dam about one-half mile above the station. Both banks are high and rocky. The bed of the stream is composed of gravel and silt, and will probably change to some extent in the shore spans. The current velocity is sufficient for accurate measurement, except at extreme low stages. The bench mark is a cut in the face of the left abutment 10.07 feet above gage datum.

Discharge measurements of West Branch of Susquehanna River at Williamsport, Pa., 1901–1904.

Date.	Hydrographer.	Gage height.	Area of section.	Mean velocity.	Discharge.
1901.		*Feet.*	*Sq. feet.*	*Ft. per sec.*	*Sec.-feet.*
Aug. 16	E. G. Paul	0.90	2,851	0.68	1,932
Oct. 25	.....do	.66	2,510	.72	1,807
1902.					
Apr. 20	E. G. Paul	3.90	5,188	1.80	9,318
Sept. 18	.....do	.41	1,997	.54	1,006
1903.					
Mar. 6	E. C. Murphy	7.12	8,629	2.80	24,138
Apr. 3	.....do	5.24	6,840	2.14	14,675
June 4	J. C. Hoyt	.85	2,769	.70	1,954
June 27	E. D. Walker	6.40	9,130	2.22	20,400
Oct. 7	W. C. Sawyer	1.77	3,270	1.08	3,525
1904.					
July 19	R. J. Taylor	2.07	3,874	1.09	4,220
Sept. 14	J. C. Hoyt	0.52	2,550	0.53	1,340
Sept. 30	.....do	1.10	3,040	0.67	2,060

Mean daily gage height, in feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1895.												
1	------	------	8.0	6.0	2.1	2.4	4.5	0.3	0.4	0.1	−0.1	1.5
2	------	------	9.0	6.0	1.9	2.1	3.7	.2	.4	.1	− .1	1.6
3	------	------	10.5	7.2	1.9	1.9	3.0	.2	.3	.2	.0	1.5
4	------	------	9.5	6.5	1.9	1.8	2.3	.1	.3	.3	.0	1.4
5	------	------	9.0	5.8	1.8	1.5	1.7	.1	.2	.3	− .1	1.4
6	------	------	6.5	5.4	1.8	1.5	1.5	.0	.2	.2	− .1	1.3
7	------	------	4.5	6.0	1.6	1.4	1.5	.0	.1	.1	.0	1.0
8	------	------	4.5	7.0	2.2	1.2	1.3	.3	.0	.2	+ .1	1.1
9	------	------	5.0	11.0	2.9	.8	1.2	.3	.0	.2	.1	1.1
10	------	------	5.2	12.0	3.2	.5	1.6	.3	.3	.1	.3	1.0
11	------	------	5.3	11.0	2.8	.4	1.5	.4	1.6	.1	.3	1.0
12	------	------	5.5	7.9	2.7	.2	1.5	.7	1.8	.2	.4	.9
13	------	------	5.5	6.5	2.8	.2	1.6	1.8	.9	.2	.4	.8
14	------	------	5.2	8.0	4.3	.4	1.5	1.5	.7	.2	.3	.6
15	------	------	6.0	10.5	3.8	.8	1.4	.5	.5	.2	.3	.4
16	------	------	6.5	8.5	3.3	.8	1.3	.6	.4	.3	.2	.3
17	------	------	5.5	6.0	3.0	.7	1.2	.7	.6	.2	.2	.3
18	------	------	5.0	5.3	2.8	.7	1.1	.9	.1	.2	.2	.3
19	------	------	4.7	5.3	2.6	.6	1.0	1.1	.2	.2	.2	.2
20	------	------	4.5	5.3	2.8	.6	.8	1.1	.2	.2	.3	.2
21	------	------	4.2	4.5	2.2	.6	.7	1.1	.1	.2	.3	.2
22	------	------	4.5	3.6	2.0	.4	.9	1.2	.0	.2	.3	1.6
23	------	------	5.0	3.4	1.9	1.0	.8	1.3	− .1	.2	.2	2.4
24	------	------	5.5	3.2	1.8	1.4	.8	1.4	− .2	.1	.2	2.6
25	------	------	6.0	2.9	1.7	1.7	.9	1.4	− .2	.0	.4	2.4
26	------	------	8.7	2.6	1.7	1.3	1.0	1.5	− .2	− .1	.5	2.2
27	------	------	9.2	2.6	2.0	1.7	− .2	1.3	− .1	− .1	2.9	2.4
28	------	------	7.7	2.5	3.5	6.2	.0	1.3	− .1	− .1	3.1	7.0
29	------	------	6.7	2.5	3.6	4.9	+ .1	1.3	.0	− .1	2.3	6.5
30	------	------	6.5	2.2	3.2	4.0	.1	1.4	+ .2	− .1	2.1	4.5
31	------	------	6.3	------	3.0	------	.4	1.4	------	− .2	------	5.4
1896.												
1	6.8	1.9	6.5	13.0	3.5	1.8	3.1	6.5	.5	6.8	2.3	4.0
2	4.5	2.0	6.6	11.0	3.4	2.0	2.7	6.7	.4	6.8	2.3	3.8
3	4.1	2.4	6.1	10.0	3.1	1.7	2.3	6.9	.4	5.8	2.3	3.3
4	3.8	4.1	4.7	8.5	3.0	1.4	2.0	5.9	.4	4.5	2.1	3.1
5	3.5	4.1	3.9	7.1	2.8	1.3	2.3	4.8	.4	3.2	2.5	2.9
6	3.3	3.9	4.1	6.1	2.6	1.2	2.4	4.0	.5	1.7	7.5	2.4
7	3.1	10.8	4.0	5.8	2.4	1.4	2.3	3.5	.5	1.5	6.9	2.0
8	2.9	9.2	3.9	5.6	2.3	1.6	2.1	3.7	.6	1.3	6.2	1.7
9	2.4	6.8	3.9	5.1	2.2	2.6	2.0	3.2	.7	.9	5.4	3.2
10	2.4	6.1	3.8	4.7	2.1	5.3	3.3	2.9	.6	.9	4.5	4.4
11	2.3	5.3	3.6	4.8	1.9	4.3	3.0	2.7	.4	.8	4.3	5.0
12	2.1	4.3	3.1	5.3	1.9	3.4	2.6	2.5	.4	.7	3.9	4.2
13	2.0	4.1	2.4	5.7	1.6	2.9	2.2	2.2	.4	9.8	4.0	4.0
14	2.0	3.7	2.7	7.8	1.6	2.5	1.9	2.5	.4	10.8	4.0	3.5
15	1.8	3.7	2.4	8.3	1.5	2.2	1.7	2.3	.5	9.8	3.6	3.3
16	1.7	4.6	2.0	7.5	1.5	2.2	1.8	2.1	.6	8.2	3.1	3.2
17	1.5	4.3	2.4	6.8	1.5	2.1	1.9	1.8	.6	6.5	3.1	2.9
18	1.4	3.6	2.5	6.1	1.6	4.1	2.2	1.5	.9	6.1	3.0	2.9
19	1.3	3.2	2.4	5.7	1.4	4.0	2.3	1.4	.6	5.4	2.8	2.7
20	1.3	1.7	3.6	5.2	1.3	3.5	1.8	1.2	1.5	4.7	2.7	2.5
21	1.4	1.5	3.8	4.7	1.4	3.0	1.6	1.0	2.0	4.0	2.7	2.2
22	1.4	2.2	3.8	4.7	1.3	2.6	1.7	.9	1.6	3.7	2.7	2.2
23	1.4	1.9	4.5	4.5	1.3	2.4	1.8	.9	.7	3.6	2.6	2.1
24	1.6	2.3	4.2	4.4	1.1	2.1	2.0	.8	.6	3.5	2.6	2.4
25	2.5	3.2	4.1	4.1	1.0	3.5	2.5	1.0	.3	3.4	2.8	2.2
26	2.7	3.1	4.2	4.2	1.1	7.0	3.1	1.0	.3	3.3	2.8	2.0
27	2.9	2.3	4.8	4.1	1.1	6.2	3.8	.9	.4	3.2	2.8	1.8
28	2.9	2.6	5.6	3.8	1.2	5.1	3.9	.6	.5	3.0	2.8	1.5
29	2.5	4.0	7.1	3.7	1.2	4.4	5.0	.6	.6	2.7	3.3	1.3
30	2.2	------	10.8	3.7	1.0	3.8	5.8	.6	1.3	2.5	4.0	1.6
31	2.0	------	13.9	------	1.5	------	6.8	.5	------	2.5	------	1.8

Mean daily gage height, in feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1897.												
1	1.9	1.6	4.0	4.3	2.6	1.9	1.0	3.1	0.7	0.9	0.4	4.4
2	2.0	1.5	3.5	4.0	3.9	1.8	1.0	3.0	.7	.9	1.0	3.8
3	2.1	1.5	3.1	3.7	5.2	1.8	1.0	2.5	.6	.8	4.8	3.4
4	2.1	1.5	5.1	3.4	8.8	2.4	.9	2.2	.6	.7	4.1	3.1
5	2.8	1.5	7.0	3.2	8.5	2.3	.9	2.1	.5	.6	3.1	4.0
6	3.9	1.5	7.4	3.3	7.9	2.0	.7	2.0	.4	.5	2.7	4.5
7	3.5	3.7	10.4	3.6	7.2	1.7	.7	2.4	.3	.5	2.3	5.0
8	3.0	4.1	9.1	3.8	6.1	1.6	.7	2.2	.3	.4	1.9	4.7
9	3.0	3.9	7.6	4.0	5.5	1.6	.7	2.1	.2	.3	1.8	4.1
10	3.0	3.7	6.9	8.0	4.9	1.8	.8	1.7	.2	.3	2.0	3.8
11	3.0	3.5	7.8	8.8	4.6	1.8	.8	1.6	.0	.3	2.1	3.6
12	3.2	3.6	8.6	7.8	4.5	1.7	1.0	2.0	.0	.3	2.9	3.8
13	2.9	3.3	8.8	6.7	4.4	1.5	.9	1.9	.1	.4	2.6	4.0
14	1.8	3.0	8.6	5.9	6.5	1.4	.9	1.7	.1	.5	2.4	4.1
15	1.7	2.7	7.7	5.6	7.4	1.3	.9	1.5	.1	.5	2.2	4.8
16	2.2	2.7	6.7	6.6	7.1	1.2	1.0	1.3	.2	.5	2.1	7.4
17	2.2	2.7	6.1	7.8	6.9	1.1	1.0	1.1	.3	.4	2.3	7.7
18	2.2	2.8	5.1	6.9	5.4	1.1	1.1	1.0	.4	.3	4.9	6.7
19	2.5	3.6	5.3	6.1	4.8	1.1	1.1	.8	.5	.3	4.5	6.3
20	2.2	3.6	5.4	5.4	4.8	1 3	1.1	1.0	.5	.3	3.8	5.9
21	1.4	3.7	8.3	4.9	4.6	1.5	1.1	1.1	.5	.4	3.4	5.3
22	1.6	3.9	8.8	4.4	4.4	1.2	1.2	1.0	.6	.5	3.0	4.9
23	2.0	5.1	8.5	4.0	3.8	1.1	1.2	.9	.7	.6	2.7	4.6
24	2.2	8.8	8.8	3.7	3.2	1.1	2.0	3.5	.8	.7	2.5	3.8
25	2.4	7.8	11.3	3.4	3.0	1.1	2.3	2.8	2.4	.6	2.3	3.6
26	2.2	6.3	10.2	3.1	2.8	1.2	2.5	2.2	2.3	.6	2.0	3.3
27	2.3	5.2	8.4	3.1	2.7	1.2	2.0	1.5	2.2	.6	2.5	3.0
28	1.5	4.3	7.1	3.0	2.6	1.2	3.1	1.2	2.0	.5	3.5	3.1
29	1.8	......	6.2	2.9	2.4	1.2	4.6	1.0	1.7	.5	5.7	2.4
30	1.9	......	5.3	2.7	2.2	1.0	4.8	.8	1.1	.4	5.0	2.0
31	1.8	......	4.7	......	2.0	......	3.8	.8	......	.4	......	2.2
1898.												
1	2.0	2.9	3.5	8.2	4.6	3.5	2.0	1.0	1.1	.6	3.3	1.8
2	1.9	2.6	3.2	6.9	4.1	3.1	1.6	.9	1.0	.5	3.0	1.9
3	1.7	2.5	3.2	6.1	4.0	2.8	1.4	1.0	.9	.5	2.7	1.9
4	1.7	2.1	3.1	5.3	3.8	2.5	1.3	1.3	.9	.5	2.4	2.1
5	1.8	2.8	3.0	4.8	3.4	2.2	1.1	2.8	.8	.6	2.2	2.3
6	2.0	2.9	2.9	4.4	3.5	2.0	1.0	2.9	.8	1.1	2.0	2.6
7	2.1	3.1	2.8	4.0	3.8	1.8	.9	2.0	.7	1.0	2.0	2.6
8	2.1	3.0	3.0	3.7	3.8	1.8	.8	1.5	.7	1.3	1.8	2.5
9	2.1	2.9	3.1	3.5	3.9	1.6	.8	1.3	.9	1.2	1.8	2.2
10	2.1	2.9	3.8	3.3	4.1	1.4	.8	1.2	1.0	1.2	1.8	2.0
11	2.5	3.1	4.7	3.2	3.7	1.6	.7	1.1	.8	1.1	4.8	1.8
12	2.6	3.8	6.3	3.0	3.4	1.8	.7	1.0	.6	1.1	9.4	1.6
13	2.9	8.4	9.0	2.9	3.2	2.0	.7	1.0	.7	1.2	7.3	1.8
14	9.6	8.0	9.4	2.7	3.0	2.5	.6	1.7	.6	1.3	6.3	1.6
15	8.7	7.1	9.4	2.7	3.0	3.4	.6	1.4	.6	1.5	5.3	1.5
16	7.5	6.3	7.2	3.5	2.9	3.1	.6	1.2	.6	1.4	4.9	1.4
17	8.2	4.7	6.2	3.5	3.0	2.5	.5	1.0	.5	1.3	4.1	1.3
18	7.2	4.6	5.8	3.5	3.0	2.0	.5	1.0	.5	1.2	3.6	1.4
19	6.1	4.3	5.4	3.2	4.0	1.9	.5	1.4	.4	1.3	3.4	1.5
20	5.3	4.8	9.0	3.1	3.9	1.8	.5	6.8	.5	2.3	3.2	1.7
21	5.6	5.3	10.8	3.0	5.1	1.7	.7	4.8	.4	2.7	3.0	2.0
22	6.2	6.4	10.2	3.0	4.8	1.6	.8	3.9	.5	4.2	2.8	2.6
23	7.0	6.0	14.9	2.9	5.1	1.6	.8	3.0	.4	9.0	2.7	5.3
24	9.9	5.3	21.0	4.0	5.1	1.4	.7	2.5	.4	8.9	2.6	8.3
25	9.3	5.0	14.8	7.7	6.0	1.3	.7	2.1	.4	7.0	2.4	7.3
26	7.6	4.6	10.4	8.7	6.3	1.2	.7	2.1	.5	5.0	2.3	6.3
27	6.8	4.2	9.6	8.2	5.6	1.1	1.9	1.9	.5	4.7	2.1	5.3
28	6.0	3.8	7.1	6.4	5.3	1.0	1.9	1.8	.6	5.0	1.9	4.7
29	5.3	......	6.3	5.7	4.8	2.1	1.3	1.7	.5	4.7	1.8	4.3
30	4.7	......	9.9	5.1	4.3	2.7	1.0	1.6	.6	4.2	1.8	4.1
31	4.1	......	10.1	......	3.9	......	1.0	1.5	......	3.6	......	3.9

Mean daily gage height, in feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895-1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	3.9	3.0	7.8	6.8	2.9	2.4	1.2	0.4	1.4	0.4	0.4	1.5
2	3.9	2.8	7.3	6.4	2.8	2.4	1.1	.3	1.5	.5	3.8	1.5
3	3.9	2.6	7.3	6.0	2.7	2.3	1.0	.3	1.5	.5	3.8	1.6
4	3.8	2.5	7.8	5.3	2.7	2.2	.9	.1	1.5	.4	3.8	1.6
5	4.8	2.6	11.8	4.5	2.9	2.1	.8	.2	1.5	.4	3.4	1.9
6	7.0	2.8	13.1	4.3	2.5	1.9	.7	.1	1.4	.4	2.9	1.6
7	8.0	2.8	11.3	4.3	2.3	1.7	.7	.0	1.3	.4	2.4	1.5
8	6.3	2.9	9.1	6.8	2.2	1.5	.7	.0	1.3	.4	2.1	1.7
9	5.3	2.9	7.3	7.8	2.3	1.3	.6	.1	1.2	.4	1.9	1.6
10	4.3	2.8	6.3	7.8	2.4	1.3	.6	.1	1.2	.4	2.0	1.7
11	4.0	2.7	5.4	6.8	2.4	1.2	.6	.2	1.1	.4	2.1	1.7
12	3.9	2.6	6.3	6.3	2.7	1.2	.6	.2	1.0	.4	2.2	1.9
13	3.8	2.4	7.3	6.8	2.5	1.1	.6	.8	.9	.4	2.3	7.0
14	4.3	2.3	7.8	7.3	2.4	1.0	.6	.6	.8	.3	2.6	7.5
15	4.8	2.3	7.1	7.3	2.3	1.0	.6	.4	.7	.3	2.9	6.3
16	5.3	2.4	6.1	6.8	2.2	1.0	.6	.2	.7	.3	3.1	5.5
17	5.8	2.5	5.8	6.3	2.0	.9	.6	.3	.6	.3	3.2	4.7
18	5.8	2.6	5.8	5.1	2.7	.9	.8	.3	.5	.3	3.6	4.0
19	5.6	2.8	7.5	4.9	6.8	.8	1.1	.2	.5	.3	3.5	3.9
20	4.5	3.2	9.3	4.6	7.3	.8	1.4	.1	.4	.3	3.5	3.8
21	3.9	3.3	8.8	4.4	6.1	.7	1.7	.0	.4	.3	3.2	4.3
22	3.9	4.2	7.6	4.2	4.9	.5	1.2	.2	.3	.3	2.9	4.9
23	3.8	5.3	6.8	4.0	4.1	.6	1.0	.1	.3	.3	2.6	4.3
24	3.8	6.8	7.0	3.7	3.6	.5	.8	.1	.4	.3	2.4	4.5
25	4.0	7.3	5.8	3.5	3.1	1.3	.7	.1	.3	.3	2.3	4.8
26	4.2	6.3	5.8	3.3	2.9	1.0	.6	.2	.3	.2	2.2	5.0
27	3.6	5.3	5.8	3.7	2.7	1.3	.6	1.4	.3	.2	2.1	4.5
28	3.5	8.3	5.6	3.6	2.5	1.2	.4	2.5	.3	.2	1.9	4.3
29	3.4	......	6.5	3.3	2.4	1.3	.3	2.0	.4	.2	1.9	3.8
30	3.2	......	8.3	3.1	2.4	1.3	.4	1.7	.4	.1	1.7	3.7
31	3.0	......	7.8	......	2.5	......	.4	1.5	......	.1	......	3.5
1900.												
1	3.3	2.9	4.0	3.9	3.3	3.3	1.3	.6	.8	.1	1.0	5.8
2	3.2	2.8	9.0	3.8	3.1	2.9	1.5	.6	.7	.1	1.0	5.0
3	3.1	2.8	8.2	4.2	2.9	3.2	1.3	.6	.6	.1	.9	4.8
4	3.0	2.9	7.1	4.5	2.7	3.5	1.0	.5	.5	.2	.9	4.3
5	2.9	2.9	6.0	4.8	2.6	3.5	.9	.5	.5	.2	.9	6.8
6	2.8	3.3	5.2	4.5	2.5	3.0	1.0	.4	.4	.2	.9	7.2
7	2.6	3.0	5.3	5.0	2.3	2.7	1.1	.4	.3	.2	.8	5.8
8	2.5	3.0	7.1	6.5	2.2	2.5	1.1	.3	.3	.3	.8	5.7
9	2.6	4.5	6.5	6.8	2.0	2.4	1.0	.3	.3	.4	.8	4.8
10	2.6	6.0	6.2	6.1	2.0	2.2	.9	.2	.3	.9	.8	4.5
11	2.6	5.5	7.0	5.5	2.0	2.0	1.0	.2	.3	1.1	.8	4.2
12	2.7	5.0	6.3	4.8	2.0	1.9	1.1	.1	.2	1.0	.9	3.5
13	2.8	5.0	5.1	4.5	2.0	1.8	1.0	.1	.2	1.0	.9	3.0
14	2.9	8.7	4.5	4.3	2.0	1.6	1.7	.2	.2	1.0	.9	2.9
15	3.0	8.5	4.1	4.1	2.3	1.7	1.3	.1	.2	.9	.9	2.8
16	3.0	6.5	3.5	3.9	2.3	1.9	1.1	.1	.1	1.1	.8	2.3
17	3.0	5.5	2.8	3.9	2.0	1.7	.9	.2	.1	1.2	.8	1.9
18	3.3	4.7	2.7	5.1	2.0	1.6	.8	.2	.2	1.1	.7	1.8
19	3.8	3.8	2.5	6.9	2.0	1.5	.8	.2	.2	.9	.7	2.1
20	4.5	3.6	3.1	6.8	2.5	1.4	.7	.2	.2	.8	.7	2.0
21	13.0	3.5	7.0	6.2	2.5	1.3	.7	.3	.2	.7	.8	2.0
22	13.0	5.5	6.1	5.5	2.3	1.2	.6	.7	.2	.7	1.0	1.9
23	10.0	9.8	5.0	5.5	2.0	1.2	.6	1.0	.1	.7	1.4	1.9
24	8.0	7.4	5.5	5.9	1.8	1.1	.6	.9	.1	.7	1.5	1.8
25	6.5	5.4	6.0	5.7	1.7	1.0	.6	.9	.1	.9	2.7	1.9
26	5.8	5.2	5.2	5.2	1.8	1.1	.5	.9	.1	1.8	4.8	2.1
27	5.0	3.2	4.9	4.7	2.0	1.0	.7	1.0	.1	1.5	17.0	2.4
28	4.5	3.9	4.5	4.2	1.9	0.9	1.0	.9	.1	1.4	12.0	2.3
29	4.0	......	4.5	3.8	1.9	0.8	.9	1.0	.1	1.3	8.0	2.3
30	4.1	......	4.4	3.6	4.0	0.8	.8	1.0	.1	1.1	5.5	2.3
31	3.3	......	4.1	......	3.6	......	.7	.9	......	1.1	......	2.2

Mean daily gage height, in feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904—Continued.

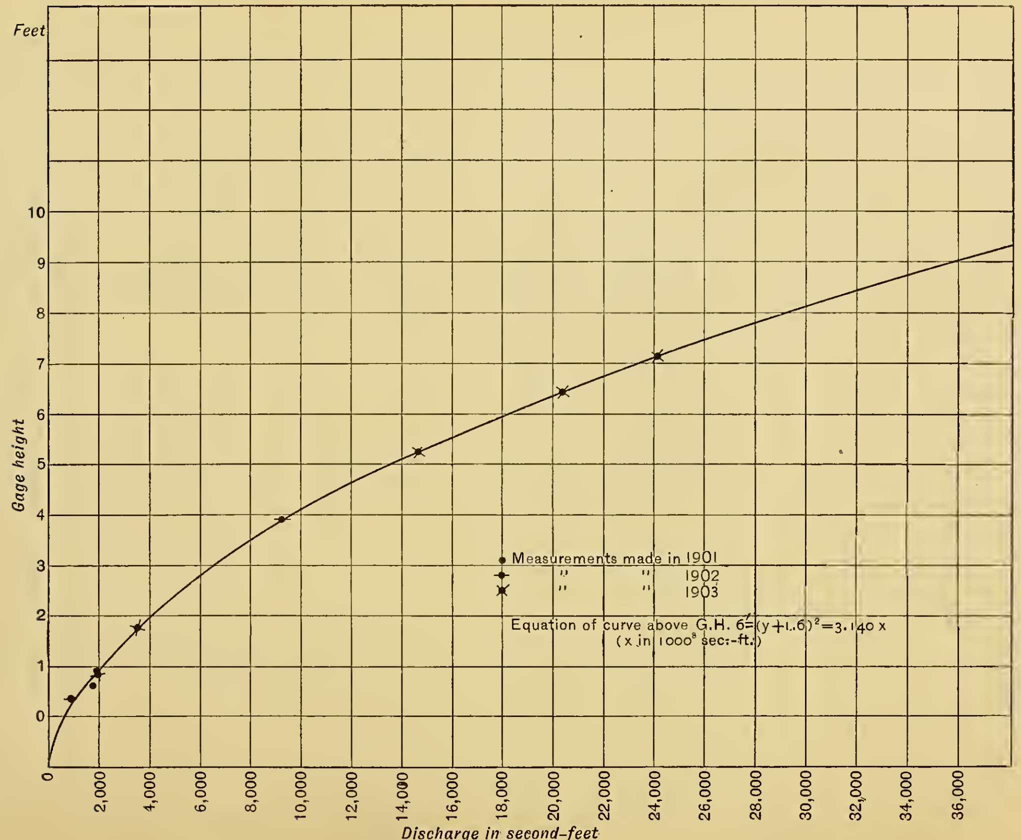
Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	2.30	1.60	.90	5.50	4.00	9.80	3.10	1.20	3.00	1.80	0.70	3.00
2	2.30	1.40	1.00	4.80	3.80	7.20	2.60	1.10	3.50	1.50	.60	2.80
3	1.90	1.40	1.30	4.50	4.00	7.00	2.30	1.00	6.80	2.00	.60	3.00
4	1.10	1.40	1.40	6.00	4.60	6.50	2.20	.80	5.70	1.50	.70	2.60
5	1.00	1.60	2.10	6.20	4.20	5.70	2.10	.70	4.60	1.40	.60	2.30
6	1.00	1.80	3.00	7.00	4.00	5.10	2.00	.70	4.10	1.30	.60	2.00
7	1.10	2.50	3.70	9.50	3.70	5.00	1.90	.80	3.30	1.20	.60	1.80
8	1.10	1.90	3.00	11.50	3.50	5.50	1.80	1.80	2.70	.90	.60	1.80
9	1.40	1.40	2.60	11.20	3.10	5.30	1.60	1.90	2.40	.80	.50	1.80
10	1.50	1.30	3.00	9.50	3.30	5.00	1.50	1.70	2.20	.90	.50	2.80
11	1.80	1.30	7.00	8.20	3.40	4.50	1.40	1.50	2.00	.90	.40	6.90
12	2.10	1.90	10.50	7.20	3.40	4.10	1.30	1.40	2.00	.90	.50	6.10
13	3.60	2.40	9.20	6.20	3.40	3.90	1.10	1.10	2.00	1.00	.60	5.50
14	4.50	2.10	7.50	5.80	3.60	3.30	1.10	.90	2.30	1.30	.60	5.20
15	4.20	1.50	6.50	5.50	3.60	3.00	1.10	.80	2.50	1.10	1.50	20.17
16	4.00	1.40	6.80	5.30	3.50	3.60	1.00	.90	2.80	.80	1.20	18.20
17	3.70	1.30	6.00	4.80	3.30	3.40	1.00	3.30	2.70	1.10	1.30	12.00
18	3.50	1.20	5.50	4.20	3.50	2.90	1.20	3.30	3.00	1.00	1.50	8.80
19	2.90	1.20	5.00	4.20	3.40	2.70	1.20	4.50	3.00	.90	1.30	7.00
20	2.40	1.30	6.20	4.00	3.20	2.60	1.10	4.20	2.80	.80	1.10	5.50
21	2.00	1.40	7.50	12.00	3.00	2.90	1.00	4.00	2.50	.80	1.00	5.00
22	1.90	1.30	9.50	15.20	1.80	4.00	.90	4.60	2.30	.70	.90	4.40
23	2.20	1.20	8.50	12.50	5.80	4.50	.70	4.00	2.00	.60	.80	3.70
24	2.60	1.00	7.50	9.70	5.50	4.40	.70	5.40	1.90	.60	1.60	3.60
25	2.40	.90	6.50	8.50	5.50	4.20	.70	7.80	1.80	.60	5.60	3.60
26	2.50	.90	7.80	7.50	5.00	3.80	.80	6.80	1.50	.60	6.70	3.70
27	2.60	1.00	10.50	6.50	5.00	3.50	.90	5.20	1.40	.60	5.70	3.90
28	2.60	1.00	11.20	5.50	7.60	3.60	1.00	4.30	1.20	.60	4.40	3.40
29	2.70	....	9.20	5.00	11.50	3.70	1.10	3.50	1.50	.70	3.60	3.20
30	2.60	....	7.80	4.50	14.00	3.50	1.20	3.00	1.90	.80	3.50	3.00
31	1.70	....	6.20	....	12.30	....	1.20	2.70	....	.70	....	3.40
1902.												
1	3.20	4.30	20.38	6.00	2.50	1.30	8.30	5.00	.50	2.70	1.90	1.00
2	2.90	4.20	21.10	5.70	2.50	1.20	7.40	4.90	.60	4.10	1.70	1.30
3	2.60	5.00	16.45	5.30	2.40	1.20	6.40	4.60	.50	3.10	1.60	1.50
4	2.50	4.70	13.00	4.90	2.70	1.10	9.70	4.30	.50	2.50	1.50	2.20
5	2.40	4.50	10.00	4.50	2.70	1.10	10.80	3.80	.50	2.40	1.40	2.40
6	2.30	4.00	8.10	4.30	2.90	1.30	8.60	3.30	.40	2.30	1.40	2.50
7	2.30	3.90	6.80	4.50	2.90	1.20	8.80	3.10	.40	2.20	1.30	2.30
8	2.30	3.70	5.90	4.70	3.20	1.20	7.30	3.00	.40	2.20	1.40	2.30
9	2.40	3.60	5.30	13.30	3.40	1.10	6.30	2.80	.40	2.00	1.40	2.80
10	2.40	3.40	5.50	16.60	3.20	1.00	6.00	2.60	.60	1.80	1.30	1.90
11	2.40	3.30	6.30	12.90	3.00	1.10	7.70	2.40	.50	1.60	1.30	2.00
12	2.40	3.00	7.10	10.30	2.80	1.10	7.20	2.20	.50	1.40	1.20	2.30
13	2.40	2.90	9.60	8.40	2.60	1.30	6.30	2.50	.60	1.20	1.20	3.10
14	2.30	3.00	12.20	7.30	2.50	1.40	5.00	2.10	.50	1.00	1.10	4.40
15	2.10	2.60	10.80	6.30	2.40	1.60	4.20	1.90	.40	1.20	1.00	3.60
16	2.10	2.30	8.40	5.50	2.20	1.80	3.60	1.80	.40	1.30	1.00	3.00
17	2.00	2.10	13.80	5.00	2.00	1.90	3.10	1.60	.40	1.60	.90	5.80
18	2.00	2.10	12.70	4.70	1.90	2.00	3.30	1.50	.40	1.50	.90	8.10
19	1.80	2.50	10.00	4.30	1.80	2.00	3.70	1.40	.30	1.40	.90	6.40
20	1.60	2.20	8.10	3.90	1.70	1.80	4.40	1.30	.20	1.30	.80	5.30
21	2.00	1.90	6.80	4.40	1.70	1.80	5.80	1.20	.20	1.30	.90	5.10
22	5.30	2.20	6.00	3.50	1.70	1.70	6.80	1.40	.20	1.20	.90	8.00
23	6.73	1.90	5.40	3.20	1.60	1.50	6.30	1.30	.20	1.10	.90	10.70
24	4.50	1.80	5.00	2.90	1.60	1.40	5.70	1.10	.20	1.00	.90	9.10
25	4.50	1.80	4.50	2.80	1.60	[a] .60	5.90	1.00	.50	1.00	1.00	7.20
26	4.00	2.00	4.20	3.30	1.60	1.50	5.80	.90	.90	.90	1.10	6.00
27	4.10	3.10	3.90	2.50	1.70	1.90	6.10	.80	2.30	.90	1.10	5.40
28	4.00	10.89	3.70	2.40	1.80	2.80	5.50	.40	2.60	1.30	1.10	4.10
29	3.90	....	3.90	2.30	1.60	2.60	5.20	.50	2.80	1.20	1.00	4.40
30	4.10	....	5.60	2.50	1.50	4.30	4.50	.60	2.30	1.50	1.00	3.60
31	4.00	....	6.20	....	1.40	....	5.20	.50	....	1.70	....	2.50

[a] Splash on dam.

Mean daily gage height, in feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895-1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	3.00	9.80	17.07	5.80	2.40	1.00	4.60	2.70	5.80	1.00	1.90	2.00
2	2.50	6.00	14.30	5.60	2.30	.50	4.20	2.30	5.30	1.00	1.70	2.00
3	3.00	7.50	10.20	5.30	2.20	.90	4.00	2.00	4.60	.90	1.70	2.00
4	4.30	a10.60	8.30	5.00	2.00	.60	4.40	1.80	4.00	.90	1.60	1.80
5	4.90	15.50	7.20	5.10	2.00	.60	4.00	2.50	3.50	1.00	1.50	1.80
6	5.30	13.20	7.10	4.70	2.00	.60	3.70	3.60	3.10	1.40	1.60	1.80
7	5.00	10.10	7.20	4.50	2.00	.70	6.00	3.80	2.70	1.70	1.50	1.70
8	4.40	7.80	7.60	4.50	1.70	1.00	5.30	4.00	2.50	2.00	1.50	1.70
9	3.70	6.70	b12.20	5.00	1.60	1.40	4.20	3.50	2.40	5.90	1.50	1.60
10	2.20	5.80	12.70	5.40	1.40	1.40	3.50	2.90	2.60	7.80	1.40	1.70
11	2.20	5.10	11.00	5.60	1.40	2.10	3.00	2.60	2.80	6.20	1.40	1.70
12	4.30	5.20	11.10	5.30	1.40	2.20	3.00	2.40	3.40	5.50	1.40	1.40
13	4.20	6.20	10.60	5.80	1.30	3.70	3.00	2.20	3.00	4.60	1.30	1.30
14	4.20	6.70	8.90	6.10	1.30	3.40	2.70	2.00	2.50	4.00	1.20	1.90
15	4.20	6.40	7.80	9.60	1.30	3.60	2.40	1.70	2.30	3.60	1.20	1.50
16	4.20	6.30	6.90	11.70	1.20	4.00	2.20	1.60	2.00	3.30	1.30	1.00
17	4.10	6.30	6.20	10.70	1.20	3.70	2.00	1.80	1.90	3.00	2.80	1.00
18	3.70	6.00	5.70	9.10	1.20	3.40	2.00	1.80	2.50	4.20	12.00	1.00
19	3.70	4.40	5.30	7.60	1.20	2.90	5.40	1.60	2.60	5.30	9.20	1.00
20	3.60	4.00	4.70	6.50	1.20	2.60	8.00	1.50	2.50	5.00	7.40	1.00
21	3.70	4.10	4.40	5.70	1.20	2.50	6.20	1.60	2.30	4.60	5.50	1.60
22	3.40	4.00	4.60	5.10	1.10	2.50	5.50	2.20	2.00	4.00	4.90	2.10
23	3.20	4.50	5.30	4.60	1.10	2.60	5.00	1.80	1.80	3.60	4.40	2.00
24	3.10	3.80	13.30	4.20	1.00	4.10	4.20	1.50	1.60	3.20	4.10	1.90
25	3.10	3.90	12.20	4.00	.90	6.10	3.60	1.50	1.50	3.00	3.80	1.80
26	3.00	3.80	9.50	3.50	.90	9.20	3.20	1.40	1.50	2.80	3.40	1.70
27	3.00	3.60	7.70	3.40	1.00	7.00	2.70	1.50	1.30	2.60	3.00	2.00
28	3.00	c9.85	6.50	3.10	1.00	5.40	2.30	1.80	1.20	2.30	2.50	2.00
29	2.80	....	5.60	2.90	1.10	4.50	2.10	3.90	1.20	2.20	2.10	2.40
30	3.00	....	5.00	2.70	1.10	5.20	2.50	7.20	1.10	2.00	1.70	2.30
31	11.00	....	4.90	....	1.10	....	2.80	6.50	....	2.00	....	2.40
1904.												
1	2.2	3.8	2.7	6.2	7.8	3.6	2.3	1.0	.4	.8	1.0	0.6
2	2.2	3.4	7.0	16.8	7.0	3.7	2.1	.9	.4	1.0	1.0	.5
3	2.0	3.0	7.5	13.6	6.2	3.7	1.9	.9	.4	1.0	1.0	.5
4	2.0	2.8	19.0	9.8	5.5	3.5	1.7	.9	.3	.9	1.0	.4
5	1.8	3.0	16.5	8.0	5.0	6.1	1.5	.8	.3	.8	.9	g.4
6	1.8	2.4	9.2	6.8	4.5	4.5	1.5	.7	.3	.8	.9	.4
7	1.7	2.6	7.4	6.4	4.2	3.7	1.7	.7	.2	.7	.8	.4
8	1.7	d5.0	17.4	6.0	3.9	3.4	1.8	.7	.2	.7	.7	.4
9	1.7	e10.5	13.5	6.0	3.6	3.2	3.4	.6	.2	.6	.6	.4
10	1.7	e7.6	9.8	8.8	3.3	3.2	4.4	.5	.2	.6	.6	.4
11	1.7	e6.0	7.6	9.2	3.2	3.3	8.1	.5	.2	.6	.7	.4
12	1.7	c5.2	6.5	7.9	3.0	3.3	6.7	.4	.5	.5	.7	.4
13	1.7	c4.3	5.8	7.2	2.8	2.9	5.4	.4	.6	.7	.7	.3
14	1.7	3.8	5.3	6.6	2.5	2.7	4.6	.5	.5	1.2	.8	.3
15	1.6	4.0	5.0	5.8	3.0	2.4	3.8	.5	.5	1.5	.8	.3
16	1.6	f3.8	4.4	5.2	3.4	2.6	3.4	.5	.6	1.4	.7	.3
17	1.5	f3.6	4.1	5.2	3.3	3.1	3.0	.3	.5	1.3	.7	.3
18	1.5	f3.5	3.8	5.1	3.2	2.8	2.5	.3	.5	1.2	.7	.2
19	1.5	3.3	4.0	5.0	4.7	2.6	2.1	.3	.4	1.1	.7	.2
20	1.5	f3.0	4.5	4.5	7.7	2.3	2.0	.4	.3	1.0	.7	.2
21	1.4	2.9	6.5	4.2	7.2	2.3	1.7	.5	.3	1.1	.6	.2
22	1.5	2.8	6.7	3.9	6.0	3.0	1.5	.5	.2	1.5	.6	.2
23	7.7	2.7	6.6	3.6	5.2	3.7	1.3	.9	.2	1.7	.6	.2
24	13.3	3.7	h9.9	3.3	4.7	4.0	1.3	1.0	.2	1.6	.7	.3
25	9.8	4.2	10.3	3.2	4.4	3.2	1.2	1.2	.2	1.5	.6	.3
26	7.0	3.8	11.3	3.6	4.2	2.8	1.1	1.0	.3	1.5	.6	.3
27	5.4	3.0	12.6	4.3	4.0	2.3	1.1	.9	.6	1.4	.6	.4
28	4.9	2.7	10.6	5.1	3.8	2.1	1.1	.7	1.0	1.3	.6	1.8
29	3.5	2.5	8.0	6.8	3.5	1.9	1.1	.6	1.0	1.3	.5	5.4
30	3.2	....	6.9	8.4	3.3	1.7	1.0	.6	1.1	1.2	.5	5.5
31	3.6	....	6.0	....	3.3	....	1.0	.5	....	1.1	....	4.4

a 16.00, 11 p. m.
b 13.2, 11 p. m.
c 15.00, 12 p. m., rising 1 foot in 2 hours.
d Ice running.
e Slush ice running.
f Anchor ice running.
g River frozen December 5 to 28, 1904.
h 18 feet at noon.



RATING CURVE FOR WEST BRANCH OF SUSQUEHANNA RIVER AT WILLIAMSPORT, PA.

Rating table for West Branch of Susquehanna River at Williamsport, Pa., for 1895 to 1904.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
−0.2	410	2.2	4,530	6.0	18,330	10.6	47,400
.0	600	2.3	4,770	6.2	19,330	10.8	49,000
.1	710	2.4	5,010	6.4	20,340	11.0	50,600
.2	830	2.5	5,250	6.6	21,360	11.2	52,200
.3	970	2.6	5,500	6.8	22,380	11.4	53,800
.4	1,120	2.7	5,760	7.0	23,400	11.6	55,500
.5	1,280	2.8	6,020	7.2	24,600	11.8	57,200
.6	1,440	2.9	6,300	7.4	25,700	12.0	58,900
.7	1,610	3.0	6,580	7.6	26,900	12.2	60,700
.8	1,780	3.2	7,170	7.8	28,100	12.4	62,500
.9	1,960	3.4	7,780	8.0	29,300	12.6	64,300
1.0	2,140	3.6	8,400	8.2	30,500	12.8	66,100
1.1	2,320	3.8	9,030	8.4	31,800	13.0	67,900
1.2	2,510	4.0	9,690	8.6	33,100	13.2	69,800
1.3	2,700	4.2	10,400	8.8	34,400	13.4	71,700
1.4	2,890	4.4	11,150	9.0	35,800	13.6	73,600
1.5	3,080	4.6	11,940	9.2	37,200	13.8	75,500
1.6	3,270	4.8	12,750	9.4	38,600	14.0	77,500
1.7	3,460	5.0	13,600	9.6	40,000	14.5	82,600
1.8	3,660	5.2	14,500	9.8	41,400	15.0	87,800
1.9	3,860	5.4	15,420	10.0	42,800		
2.0	4,070	5.6	16,370	10.2	44,300		
2.1	4,300	5.8	17,340	10.4	45,800		

Mean daily discharge, in second-feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1895.												
1	-------	-------	29,300	18,330	4,300	5,010	11,540	970	1,120	710	500	3,080
2	-------	-------	35,800	18,330	3,860	4,300	8,710	830	1,120	710	500	3,270
3	-------	-------	46,600	24,600	3,860	3,860	6,580	830	970	830	600	3,080
4	-------	-------	39,300	20,850	3,860	3,660	4,770	710	970	970	600	2,890
5	-------	-------	35,800	17,340	3,660	3,080	3,460	710	830	970	500	2,890
6	-------	-------	20,850	15,420	3,660	3,080	3,080	600	830	830	500	2,700
7	-------	-------	11,540	18,330	3,270	2,890	3,080	600	710	710	600	2,140
8	-------	-------	11,540	23,400	4,530	2,510	2,700	970	600	830	710	2,320
9	-------	-------	13,600	50,600	6,300	1,780	2,510	970	600	830	710	2,320
10	-------	-------	14,500	58,900	7,170	1,280	3,270	970	970	710	970	2,140
11	-------	-------	14,960	50,600	6,020	1,120	3,080	1,120	3,270	710	970	2,140
12	-------	-------	15,890	28,700	5,760	830	3,080	1,610	3,660	830	1,120	1,960
13	-------	-------	15,890	20,850	6,020	830	3,270	3,660	1,960	830	1,120	1,780
14	-------	-------	14,500	29,300	10,770	1,120	3,080	3,080	1,610	830	970	1,440
15	-------	-------	18,330	46,600	9,030	1,780	2,890	1,280	1,280	830	970	1,120
16	-------	-------	20,850	32,400	7,470	1,780	2,700	1,440	1,120	970	830	970
17	-------	-------	15,890	18,330	6,580	1,610	2,510	1,610	1,440	830	830	970
18	-------	-------	13,600	14,960	6,020	1,610	2,320	1,960	710	830	830	970
19	-------	-------	12,340	14,960	5,500	1,440	2,140	2,320	830	830	830	830
20	-------	-------	11,540	14,960	6,020	1,440	1,780	2,320	830	830	970	830
21	-------	-------	10,400	11,540	4,530	1,440	1,610	2,320	710	830	970	830
22	-------	-------	11,540	8,400	4,070	1,120	1,960	2,510	600	830	970	3,270
23	-------	-------	13,600	7,780	3,860	2,140	1,780	2,700	500	830	830	5,010
24	-------	-------	15,890	7,170	3,660	2,890	1,780	2,890	410	710	830	5,500
25	-------	-------	18,330	6,300	3,460	3,460	1,960	2,890	410	600	1,120	5,010
26	-------	-------	33,700	5,500	3,460	2,700	2,140	3,080	410	500	1,280	4,530
27	-------	-------	37,200	5,500	4,070	3,460	410	2,700	500	500	6,300	5,010
28	-------	-------	27,500	5,250	8,090	19,330	600	2,700	500	500	6,870	23,400
29	-------	-------	21,870	5,250	8,400	13,170	710	2,700	600	500	4,770	20,850
30	-------	-------	20,850	4,530	7,170	9,690	710	2,890	830	500	4,300	11,540
31	-------	-------	19,830	-------	6,580	-------	1,120	2,890	-------	410	-------	15,420
1896.												
1	22,380	3,860	20,850	67,900	8,090	3,660	6,870	20,850	1,280	22,380	4,770	9,690
2	11,540	4,070	21,360	50,600	7,780	4,070	5,760	21,870	1,120	22,380	4,770	9,030
3	10,040	5,010	18,830	42,800	6,870	3,460	4,770	22,890	1,120	17,340	4,770	7,470
4	9,030	10,040	12,340	32,400	6,580	2,890	4,070	17,830	1,120	11,540	4,300	6,870
5	8,090	10,040	9,360	24,000	6,020	2,700	4,770	12,750	1,120	7,170	5,250	6,300
6	7,470	9,360	10,040	18,830	5,500	2,510	5,010	9,690	1,280	3,460	26,300	5,010
7	6,870	49,000	9,690	17,340	5,010	2,890	4,770	8,090	1,280	3,080	22,890	4,070
8	6,300	37,200	9,360	16,370	4,770	3,270	4,300	8,710	1,440	2,700	19,330	3,460
9	5,010	22,380	9,360	14,050	4,530	5,500	4,070	7,170	1,610	1,960	15,420	7,170
10	5,010	18,830	9,030	12,340	4,300	14,960	7,470	6,300	1,440	1,960	11,540	11,150
11	4,770	14,960	8,400	12,750	3,860	10,770	6,580	5,760	1,120	1,780	10,770	13,600
12	4,300	10,770	6,870	14,960	3,860	7,780	5,500	5,250	1,120	1,610	9,360	10,400
13	4,070	10,040	5,010	16,850	3,270	6,300	4,530	4,530	1,120	41,400	9,690	9,690
14	4,070	8,710	5,760	28,100	3,270	5,250	3,860	5,250	1,120	49,000	9,690	8,090
15	3,660	8,710	5,010	31,100	3,080	4,530	3,460	4,770	1,280	41,400	8,400	7,470
16	3,460	11,940	4,070	26,300	3,080	4,530	3,660	4,300	1,440	30,500	6,870	7,170
17	3,080	10,770	5,010	22,380	3,080	4,300	3,860	3,660	1,440	20,850	6,870	6,300
18	2,890	8,400	5,250	18,830	3,270	10,040	4,530	3,080	1,960	18,830	6,580	6,300
19	2,700	7,170	5,010	16,850	2,890	9,690	4,770	2,890	1,440	15,420	6,020	5,760
20	2,700	3,460	8,400	14,500	2,700	8,090	3,660	2,510	3,080	12,340	5,760	5,250
21	2,890	3,080	9,030	12,340	2,890	6,580	3,270	2,140	4,070	9,690	5,760	4,530
22	2,890	4,530	9,030	12,340	2,700	5,500	3,460	1,960	3,270	8,710	5,760	4,530
23	2,890	3,860	11,540	11,540	2,700	5,010	3,660	1,960	1,610	8,400	5,500	4,300
24	3,270	4,770	10,400	11,150	2,320	4,300	4,070	1,780	1,440	8,090	5,500	5,010
25	5,250	7,170	10,040	10,040	2,140	8,090	5,250	2,140	970	7,780	6,020	4,530
26	5,760	6,870	10,400	10,400	2,320	23,400	6,870	2,140	970	7,470	6,020	4,070
27	6,300	4,770	12,750	10,040	2,320	19,330	9,030	1,960	1,120	7,170	6,020	3,660
28	6,300	5,500	16,370	9,030	2,510	14,050	9,360	1,440	1,280	6,580	6,020	3,080
29	5,250	9,690	24,000	8,710	2,510	11,150	13,600	1,440	1,440	5,760	7,470	2,700
30	4,530	-------	49,000	8,710	2,140	9,030	17,340	1,440	2,700	5,250	9,690	3,270
31	4,070	-------	76,500	-------	3,080	-------	22,380	1,280	-------	5,250	-------	3,660

Mean daily discharge, in second-feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1897..												
1	3,860	3,270	9,690	10,770	5,500	3,860	2,140	6,870	1,610	1,960	1,120	11,150
2	4,070	3,080	8,090	9,690	9,360	3,660	2,140	6,580	1,610	1,960	2,140	9,030
3	4,300	3,080	6,870	8,710	14,500	3,660	2,140	5,250	1,440	1,780	12,750	7,780
4	4,300	3,080	14,050	7,780	34,400	5,010	1,960	4,530	1,440	1,610	10,040	6,870
5	6,020	3,080	23,400	7,170	32,400	4,770	1,960	4,300	1,280	1,440	6,870	9,690
6	9,360	3,080	25,700	7,470	28,700	4,070	1,610	4,070	1,120	1,280	5,760	11,540
7	8,090	8,710	45,800	8,400	24,600	3,460	1,610	5,010	970	1,280	4,770	13,600
8	6,580	10,040	36,500	9,030	18,830	3,270	1,610	4,530	970	1,120	3,860	12,340
9	6,580	9,360	26,900	9,690	15,890	3,270	1,610	4,300	830	970	3,660	10,040
10	6,580	8,710	22,890	29,300	13,170	3,660	1,780	3,460	830	970	4,070	9,030
11	6,580	8,090	28,100	34,400	11,940	3,660	1,780	3,270	600	970	4,300	8,400
12	7,170	8,400	33,100	28,100	11,540	3,460	2,140	4,070	600	970	6,300	9,030
13	6,300	7,470	34,400	21,870	11,150	3,080	1,960	3,860	710	1,120	5,500	9,690
14	3,660	6,580	33,100	17,830	20,850	2,890	1,960	3,460	710	1,280	5,010	10,040
15	3,460	5,760	27,500	16,370	25,700	2,700	1,960	3,080	710	1,280	4,530	12,750
16	4,530	5,760	21,870	21,360	24,000	2,510	2,140	2,700	830	1,280	4,300	25,700
17	4,530	5,760	18,830	28,100	22,890	2,320	2,140	2,320	970	1,120	4,770	27,500
18	4,530	6,020	14,050	22,890	15,420	2,320	2,320	2,140	1,120	970	13,170	21,870
19	5,250	8,400	14,960	18,830	12,750	2,320	2,320	1,780	1,280	970	11,540	19,830
20	4,530	8,400	15,420	15,420	12,750	2,700	2,320	2,140	1,280	970	9,030	17,830
21	2,890	8,710	31,100	13,170	11,940	3,080	2,320	2,320	1,280	1,120	7,780	14,960
22	3,270	9,360	34,400	11,150	11,150	2,510	2,510	2,140	1,440	1,280	6,580	13,170
23	4,070	14,050	32,400	9,690	9,030	2,320	2,510	1,960	1,610	1,440	5,760	11,940
24	4,530	34,400	34,400	8,710	7,170	2,320	4,070	8,090	1,780	1,610	5,250	9,030
25	5,010	28,100	53,000	7,780	6,580	2,320	4,770	6,020	5,010	1,440	4,770	8,400
26	4,530	19,830	44,300	6,870	6,020	2,510	5,250	4,530	4,770	1,440	4,070	7,470
27	4,770	14,500	31,800	6,870	5,760	2,510	4,070	3,080	4,530	1,440	5,250	6,580
28	3,080	10,770	24,000	6,580	5,500	2,510	6,870	2,510	4,070	1,280	8,090	6,870
29	3,660	-------	19,330	6,300	5,010	2,510	11,940	2,140	3,460	1,280	16,850	5,010
30	3,860	-------	14,960	5,760	4,530	2,140	12,750	1,780	2,320	1,120	13,600	4,070
31	3,660	-------	12,340	-------	4,070	-------	9,030	1,780	-------	1,120	-------	4,530
1898.												
1	4,070	6,300	8,090	30,500	11,940	8,090	4,070	2,140	2,330	1,440	7,470	3,660
2	3,860	5,500	7,170	22,890	10,040	6,870	3,270	1,960	2,140	1,280	6,580	3,860
3	3,460	5,250	7,170	18,830	9,690	6,020	2,890	2,140	1,960	1,280	5,760	3,860
4	3,460	4,300	6,870	14.960	9.030	5,250	2,700	2,700	1,960	1,280	5,010	4,300
5	3,660	6,020	6,580	12,750	7,780	4,530	2,320	6,020	1.780	1,440	4,530	4,770
6	4,070	6,300	6,300	11,150	8,090	4,070	2,140	6,300	1,780	2,320	4,070	5,500
7	4,300	6,870	6,020	9,690	9,030	3,660	1,960	4,070	1.610	2.140	4,070	5,500
8	4,300	6,580	6,580	8,710	9,030	3,660	1,780	3,080	1,610	2,700	3,660	5,250
9	4,300	6,300	6,870	8,090	9,360	3,270	1,780	2,700	1,960	2,510	3,660	4,530
10	4,300	6,300	9,030	7,470	10,040	2,890	1,870	2,510	2,140	2,510	3,660	4,070
11	5,250	6,870	12,340	7,170	8,710	3,270	1,610	2,320	1,780	2,320	12,570	3,660
12	5,500	9,030	19,830	6,580	7,780	3,660	1,610	2,140	1,440	2,320	38,600	3,270
13	6,300	31,800	35,800	6,300	7,170	4,070	1,610	2,140	1,610	2,510	25,100	3,660
14	40,000	29,300	38,600	5,760	6,580	5,250	1,440	3,460	1,440	2,700	19,830	3,270
15	33,700	24,000	38,600	5,760	6,580	7,780	1,440	2,890	1,440	3,080	14,960	3,080
16	26,300	19,830	24,600	8,090	6,300	6,870	1,440	2,510	1,440	2,890	13,170	2,890
17	30,500	12,340	19,330	8,090	6,580	5,250	1,280	2,140	1,280	2,700	10,040	2,700
18	24,600	11,940	17,340	8,090	6,580	4,070	1,280	2,140	1,280	2,510	8,400	2,890
19	18,830	10,770	15,420	7,170	9,690	3,860	1,280	2,890	1,120	2,700	7,780	3,080
20	14,960	12,750	35,800	6,870	9,360	3,660	1,280	22,380	1,280	4,770	7,170	3,460
21	16,370	14,960	49,000	6,580	14,050	3,460	1,610	12,750	1,120	5,760	6,580	4,070
22	19,330	20,340	44.300	6,580	12,750	3,270	1,780	9,360	1,280	10,400	6,020	5,500
23	23,400	18,330	86,800	6,300	14,050	3,270	1,780	6,580	1,120	35,800	5,760	14,960
24	42,100	14,960	162,600	9,690	14,050	2,890	1,610	5,250	1,120	35,100	5,500	31,100
25	37,900	13,600	85,800	27,500	18,330	2,700	1,610	4,300	1,120	23,400	5,010	25,100
26	26,900	11,940	45,800	33,700	19,830	2,510	1,610	4,300	1,280	13,600	4,770	19,830
27	22,380	10,400	40,000	30,500	16,370	2,320	3,860	3,860	1,280	12,340	4,300	14,960
28	18,330	9,030	24,000	20,340	14,960	2,140	3,860	3,660	1,440	13,600	3,860	12,340
29	14,960	-------	19,830	16,850	12,750	4,300	2,700	3,460	1,280	12,340	3,660	10,770
30	12,340	-------	42,100	14,050	10,770	5,760	2,140	3,270	1,440	10,400	3,660	10,440
31	10,040	-------	43,500	-------	9,360	-------	2,140	3,080	-------	8,400	-------	9,360

Mean daily discharge, in second-feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	9,360	6,580	28,100	22,380	6,300	5,010	2,510	1,120	2,890	1,120	1,120	3,080
2	9,360	6,020	25,100	20,340	6,020	5,010	2,320	970	3,080	1,280	9,030	3,080
3	9,360	5,500	25,100	18,330	5,760	4,770	2,140	970	3,080	1,280	9,030	3,270
4	9,030	5,250	28,100	14,960	5,760	4,530	1,960	710	3,080	1,120	9,030	3,270
5	12,750	5,500	57,200	11,540	6,300	4,300	1,780	830	3,080	1,120	7,780	3,860
6	23,400	6,020	68,800	10,770	5,250	3,860	1,610	710	2,890	1,120	6,300	3,270
7	29,300	6,020	53,000	10,770	4,770	3,460	1,610	600	2,700	1,120	5,010	3,080
8	19,830	6,300	36,500	22,380	4,530	3,080	1,610	600	2,700	1,120	4,300	3,460
9	14,960	6,300	25,100	28,100	4,770	2,700	1,440	710	2,510	1,120	3,860	3,270
10	10,770	6,020	19,830	28,100	5,010	2,700	1,440	710	2,510	1,120	4,070	3,460
11	9,690	5,760	15,420	22,380	5,010	2,510	1,440	830	2,320	1,120	4,300	3,460
12	9,360	5,500	19,830	19,830	5,760	2,510	1,440	830	2,140	1,120	4,530	3,860
13	9,030	5,010	25,100	22,380	5,250	2,320	1,440	1,780	1,960	1,120	4,770	23,400
14	10,770	4,770	28,100	25,100	5,010	2,140	1,440	1,440	1,780	970	5,500	26,300
15	12,750	4,770	24,000	25,100	4,770	2,140	1,440	1,120	1,610	970	6,300	19,830
16	14,960	5,010	18,830	22,380	4,530	2,140	1,440	830	1,610	970	6,870	15,890
17	17,340	5,250	17,340	19,830	4,070	1,960	1,440	970	1,440	970	7,170	12,340
18	17,340	5,500	17,340	14,050	5,760	1,960	1,780	970	1,280	970	8,400	9,690
19	16,370	6,020	26,300	13,170	22,380	1,780	2,320	830	1,280	970	8,090	9,360
20	11,540	7,170	37,900	11,940	25,100	1,780	2,890	710	1,120	970	8,090	9,030
21	9,360	7,470	34,400	11,150	18,830	1,610	3,460	600	1,120	970	7,170	10,770
22	9,360	10,400	26,900	10,400	13,170	1,280	2,510	830	970	970	6,300	13,170
23	9,030	14,960	22,380	9,690	10,040	1,440	2,140	710	970	970	5,500	10,770
24	9,030	22,380	23,400	8,710	8,400	1,280	1,780	710	1,120	970	5,010	11,540
25	9,690	25,100	17,340	8,090	6,870	2,700	1,610	710	970	970	4,770	12,750
26	10,400	19,830	17,340	7,470	6,300	2,140	1,440	830	970	830	4,530	13,600
27	8,400	14,960	17,340	8,710	5,760	2,700	1,440	2,890	970	830	4,300	11,540
28	8,090	31,100	16,370	8,400	5,250	2,510	1,120	5,250	970	830	3,860	10,770
29	7,780	....	20,850	7,470	5,010	2,700	970	4,070	1,120	830	3,860	9,030
30	7,170	....	31,100	6,870	5,010	2,700	1,120	3,460	1,120	710	3,460	8,710
31	6,580	....	28,100	....	5,250	....	1,120	3,080	....	710	....	8,090
1900.												
1	7,470	6,300	9,690	9,360	7,470	7,470	2,700	1,440	1,780	710	2,140	17,340
2	7,170	6,020	35,800	9,030	6,870	6,300	3,080	1,440	1,610	710	2,140	13,600
3	6,870	6,020	30,500	10,400	6,300	7,170	2,700	1,440	1,440	710	1,960	12,750
4	6,580	6,300	24,000	11,540	5,760	8,090	2,140	1,280	1,280	830	1,960	10,770
5	6,300	6,300	18,330	12,750	5,500	8,090	1,960	1,280	1,280	830	1,960	22,380
6	6,020	7,470	14,500	11,540	5,250	6,580	2,140	1,120	1,120	830	1,960	24,600
7	5,500	6,580	14,960	13,600	4,770	5,760	2,320	1,120	970	830	1,780	17,340
8	5,250	6,580	24,000	20,850	4,530	5,250	2,320	970	970	970	1,780	16,850
9	5,500	11,540	20,850	22,380	4,070	5,010	2,140	970	970	1,120	1,780	12,750
10	5,500	18,330	19,330	18,830	4,070	4,530	1,960	830	970	1,960	1,780	11,540
11	5,500	15,890	23,400	15,890	4,070	4,070	2,140	830	970	2,320	1,780	10,400
12	5,760	13,600	19,830	12,750	4,070	3,860	2,320	710	830	2,140	1,960	8,090
13	6,020	13,600	14,050	11,540	4,070	3,660	2,140	710	830	2,140	1,960	6,580
14	6,300	33,700	11,540	10,770	4,070	3,270	3,460	830	830	2,140	1,960	6,300
15	6,580	32,400	10,040	10,040	4,770	3,460	2,700	710	830	1,960	1,960	6,020
16	6,580	20,850	8,090	9,360	4,770	3,860	2,320	710	710	2,320	1,780	4,770
17	6,580	15,890	6,020	9,360	4,070	3,460	1,960	830	710	2,510	1,780	3,860
18	7,470	12,340	5,760	14,050	4,070	3,270	1,780	830	830	2,320	1,610	3,660
19	9,030	9,030	5,250	22,890	4,070	3,080	1,780	830	830	1,960	1,610	4,300
20	11,540	8,400	6,870	22,380	5,250	2,890	1,610	830	830	1,780	1,610	4,070
21	67,900	8,090	23,400	19,330	5,250	2,700	1,610	970	830	1,610	1,780	4,070
22	67,900	15,890	18,830	15,890	4,770	2,510	1,440	1,610	830	1,610	2,140	3,860
23	42,800	41,400	13,600	15,890	4,070	2,510	1,440	2,140	710	1,610	2,890	3,860
24	29,300	25,700	15,890	17,830	3,660	2,320	1,440	1,960	710	1,610	3,080	3,660
25	20,850	15,420	18,330	16,850	3,460	2,140	1,440	1,960	710	1,960	5,760	3,860
26	17,340	14,500	14,500	14,500	3,660	2,320	1,280	1,960	710	3,660	12,750	4,300
27	13,600	7,170	13,170	12,340	4,070	2,140	1,610	2,140	710	3,080	110,100	5,010
28	11,540	9,360	11,540	10,400	3,860	1,960	2,140	1,960	710	2,890	58,900	4,770
29	9,690	....	11,540	9,030	3,860	1,780	1,960	2,140	710	2,700	29,300	4,770
30	10,040	....	11,150	8,400	9,690	1,780	1,780	2,140	710	2,320	15,890	4,770
31	7,470	....	10,040	....	8,400	....	1,610	1,960	....	2,320	....	4,530

Mean daily discharge, in second-feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	4,770	3,270	1,960	15,890	9,690	41,400	6,870	2,510	6,580	3,660	1,610	6,580
2	4,770	2,890	2,140	12,750	9,030	24,600	5,500	2,320	8,090	3,080	1,440	6,020
3	3,860	2,890	2,700	11,540	9,690	23,400	4,770	2,140	22,380	4,070	1,440	6,580
4	2,320	2,890	2,890	18,330	11,940	20,850	4,530	1,780	16,850	3,080	1,610	5,500
5	2,140	3,270	4,300	19,330	10,400	16,850	4,300	1,610	11,940	2,890	1,440	4,770
6	2,140	3,660	6,580	23,400	9,690	14,050	4,070	1,610	10,040	2,700	1,440	4,070
7	2,320	5,250	8,710	39,300	8,710	13,600	3,860	1,780	7,470	2,510	1,440	3,660
8	2,320	3,860	6,580	54,600	8,090	15,890	3,660	3,660	5,760	1,960	1,440	3,660
9	2,890	2,890	5,500	52,200	6,870	14,960	3,270	3,860	5,010	1,780	1,280	3,660
10	3,080	2,700	6,580	39,300	7,470	13,600	3,080	3,460	4,530	1,960	1,280	6,020
11	3,660	2,700	23,400	30,500	7,780	11,540	2,890	3,080	4,070	1,960	1,120	22,890
12	4,300	3,860	46,600	24,600	7,780	10,040	2,700	2,890	4,070	1,960	1,280	18,830
13	8,400	5,010	37,200	19,330	7,780	9,360	2,320	2,320	4,070	2,140	1,440	15,890
14	11,540	4,300	26,300	17,340	8,400	7,470	2,320	1,960	4,770	2,700	1,440	14,500
15	10,400	3,080	20,850	15,890	8,400	6,580	2,320	1,780	5,250	2,320	3,080	150,900
16	9,690	2,890	22,380	14,960	8,090	8,400	2,140	1,960	6,020	1,780	2,510	124,800
17	8,710	2,700	18,330	12,750	7,470	7,780	2,140	7,470	5,760	2,320	2,700	58,900
18	8,090	2,510	15,890	10,400	8,090	6,300	2,510	7,470	6,580	2,140	3,080	34,400
19	6,300	2,510	13,600	10,400	7,780	5,760	2,510	11,540	6,580	1,960	2,700	23,400
20	5,010	2,700	19,330	9,690	7,170	5,500	2,320	10,400	6,020	1,780	2,320	15,890
21	4,070	2,890	26,300	58,900	6,580	6,300	2,140	9,690	5,250	1,780	2,140	13,600
22	3,860	2,700	39,300	89,900	3,660	9,690	1,960	11,940	4,770	1,610	1,960	11,150
23	4,530	2,510	32,400	63,400	17,340	11,540	1,610	9,690	4,070	1,440	1,780	8,710
24	5,500	2,140	26,300	40,700	15,890	11,150	1,610	15,420	3,860	1,440	3,270	8,400
25	5,010	1,960	20,850	32,400	15,890	10,400	1,610	28,100	3,660	1,440	16,370	8,400
26	5,250	1,960	28,100	26,300	13,600	9,030	1,780	22,380	3,080	1,440	21,870	8,710
27	5,500	2,140	46,600	20,850	13,600	8,090	1,960	14,500	2,890	1,440	16,850	9,360
28	5,500	2,140	52,200	15,890	26,900	8,400	2,140	10,770	2,510	1,440	11,150	7,780
29	5,760	....	37,200	13,600	54,600	8,710	2,320	8,090	3,080	1,610	8,400	7,170
30	5,500	....	28,100	11,540	77,500	8,090	2,510	6,580	3,860	1,780	8,090	6,580
31	3,460	....	19,330	....	61,600	....	2,510	5,760	....	1,610	....	7,780
1902.												
1	7,170	10,770	154,100	18,330	5,250	2,700	31,100	13,600	1,280	5,760	3,860	2,140
2	6,300	10,400	164,100	16,850	5,250	2,510	25,700	13,170	1,440	10,040	3,460	2,700
3	5,500	13,600	103,750	14,960	5,010	2,510	20,340	11,940	1,280	6,870	3,270	3,080
4	5,250	12,340	67,900	13,170	5,760	2,320	40,700	10,770	1,280	5,250	3,080	4,530
5	5,010	11,540	42,800	11,540	5,760	2,320	49,000	9,030	1,280	5,010	2,890	5,010
6	4,770	9,690	29,900	10,770	6,300	2,700	33,100	7,470	1,120	4,770	2,890	5,250
7	4,770	9,360	22,380	11,540	6,300	2,510	34,400	6,870	1,120	4,530	2,700	4,770
8	4,770	8,710	17,830	12,340	7,170	2,510	25,100	6,580	1,120	4,530	2,890	4,770
9	5,010	8,400	14,960	70,700	7,780	2,320	19,830	6,020	1,120	4,070	2,890	6,020
10	5,010	7,780	15,890	105,500	7,170	2,140	18,330	5,500	1,440	3,660	2,700	3,860
11	5,010	7,470	19,830	6,700	6,580	2,320	27,500	5,010	1,280	3,270	2,700	4,070
12	5,010	6,580	24,000	45,000	6,020	2,320	24,600	4,530	1,280	2,890	2,510	4,770
13	5,010	6,300	40,000	31,800	5,500	2,700	19,830	5,250	1,440	2,510	2,510	6,870
14	4,770	6,580	60,700	25,100	5,250	2,890	13,600	4,300	1,280	2,140	2,320	11,150
15	4,300	5,500	49,000	19,830	5,010	3,270	10,400	3,860	1,120	2,510	2,140	8,400
16	4,300	4,770	31,800	15,890	4,530	3,660	8,400	3,660	1,120	2,700	2,140	6,580
17	4,070	4,300	75,500	13,600	4,070	3,860	6,870	3,270	1,120	3,270	1,960	17,340
18	4,070	4,300	65,200	12,340	3,860	4,070	7,470	3,080	1,120	3,080	1,960	29,900
19	3,660	5,250	42,800	10,770	3,660	4,070	8,710	2,890	970	2,890	1,960	20,340
20	3,270	4,530	29,900	9,360	3,460	3,660	11,150	2,700	830	2,700	1,780	14,960
21	4,070	3,860	22,380	11,150	3,460	3,660	17,340	2,510	830	2,700	1,960	14,050
22	14,960	4,530	18,330	8,090	3,460	3,460	22,380	2,890	830	2,510	1,960	29,300
23	22,130	3,860	15,420	7,170	3,270	3,080	19,830	2,700	830	2,320	1,960	48,200
24	11,540	3,660	13,600	6,300	3,270	2,890	16,850	2,320	830	2,140	1,960	36,500
25	11,540	3,660	11,540	6,020	3,270	1,440	17,830	2,140	1,280	2,140	2,140	24,600
26	9,690	4,070	10,400	7,470	3,270	3,080	17,340	1,960	1,960	1,960	2,320	18,330
27	10,040	6,870	9,360	5,250	3,460	3,860	18,830	1,780	4,770	1,960	2,320	15,420
28	9,690	49,800	8,710	5,010	3,660	6,020	15,890	1,120	5,500	2,700	2,320	10,040
29	9,360	....	9,360	4,770	3,270	5,500	14,500	1,280	6,020	2,510	2,140	11,150
30	10,040	....	16,370	5,250	3,080	10,770	11,540	1,440	4,770	3,080	....	8,400
31	9,690	....	19,330	....	2,890	....	14,500	1,280	....	3,460	....	5,250

Mean daily discharge, in second-feet, of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	6,580	41,400	110,700	17,340	5,010	2,140	11,940	5,760	17,340	2,140	3,860	4,070
2	5,250	18,330	80,500	16,370	4,770	1,280	10,400	4,770	14,960	2,140	3,460	4,070
3	6,580	26,300	44,300	14,960	4,530	1,960	9,690	4,070	11,940	1,960	3,460	4,070
4	10,770	47,400	31,100	13,600	4,070	1,440	11,150	3,660	9,690	1,960	3,270	3,660
5	13,170	93,100	24,600	14,050	4,070	1,440	9,690	5,250	8,090	2,140	3,080	3,660
6	14,960	69,800	24,000	12,340	4,070	1,440	8,710	8,400	6,870	2,890	3,270	3,660
7	13,600	43,500	24,600	11,540	4,070	1,610	18,330	9,030	5,760	3,460	3,080	3,460
8	11,150	28,100	26,900	11,540	3,460	2,140	14,960	9,690	5,250	4,070	3,080	3,460
9	8,710	21,870	60,700	13,600	3,270	2,890	10,400	8,090	5,010	17,830	3,080	3,270
10	4,530	17,340	65,200	15,420	2,890	2,890	8,090	6,300	5,500	28,100	2,890	3,460
11	4,530	14,050	50,600	16,370	2,890	4,300	6,580	5,500	6,020	19,330	2,890	3,460
12	10,770	14,500	51,400	14,960	2,890	4,530	6,580	5,010	7,780	15,890	2,890	2,890
13	10,400	19,330	47,400	17,340	2,700	8,710	6,580	4,530	6,580	11,940	2,700	2,700
14	10,400	21,870	35,100	18,830	2,700	7,780	5,760	4,070	5,250	9,690	2,510	3,860
15	10,400	20,340	28,100	40,000	2,700	8,400	5,010	3,460	4,770	8,400	2,510	3,080
16	10,040	19,830	22,890	56,300	2,510	9,690	4,530	3,270	4,070	7,470	2,700	2,140
17	10,400	19,830	19,330	48,200	2,510	8,710	4,070	3,660	3,860	6,580	6,020	2,140
18	8,710	18,330	16,850	36,500	2,510	7,780	4,070	3,660	5,250	10,400	58,900	2,140
19	8,710	11,150	14,960	26,900	2,510	6,300	15,420	3,270	5,500	14,960	37,200	2,140
20	8,400	9,690	12,340	20,850	2,510	5,500	29,300	3,080	5,250	13,600	25,700	2,140
21	8,710	10,040	11,150	16,850	2,510	5,250	19,330	3,270	4,770	11,940	15,890	3,270
22	7,780	9,690	11,940	14,050	2,320	5,250	15,890	4,530	4,070	9,690	13,170	4,300
23	7,170	11,540	14,960	11,940	2,320	5,500	13,600	3,660	3,660	8,400	11,150	4,070
24	6,870	9,030	70,700	10,400	2,140	10,040	10,400	3,080	3,270	7,170	10,040	3,860
25	6,870	9,360	60,700	9,690	1,960	18,830	8,400	3,080	3,080	6,580	9,030	3,660
26	6,580	9,030	39,300	8,090	1,960	37,200	7,170	2,890	3,080	6,020	7,780	3,460
27	6,580	8,400	27,500	7,780	2,140	23,400	5,760	3,080	2,700	5,500	6,580	4,070
28	6,580	41,700	20,850	6,870	2,140	15,420	4,770	3,660	2,510	4,770	5,250	4,070
29	6,020	......	16,370	6,300	2,320	11,540	4,300	9,360	2,510	4,530	4,300	5,010
30	6,580	......	13,600	5,760	2,320	14,500	5,250	24,600	2,320	4,070	3,460	4,770
31	50,600	......	13,170	......	2,320	......	6,020	20,850	......	4,070	......	5,010
1904.												
1	4,530	9,030	5,760	19,330	28,100	8,400	4,770	2,140	1,120	1,780	2,140	1,440
2	4,530	7,780	23,400	107,800	23,400	8,710	4,300	1,960	1,120	2,140	2,140	1,280
3	4,070	6,580	26,300	73,600	19,330	8,710	3,860	1,960	1,120	2,140	2,140	1,280
4	4,070	6,020	135,100	41,400	15,890	8,090	3,460	1,960	970	1,960	2,140	1,120
5	3,660	6,580	104,300	29,300	13,600	18,830	3,080	1,780	970	1,780	1,960	1,120
6	3,660	5,010	37,200	22,380	11,540	11,540	3,080	1,610	970	1,780	1,960	1,120
7	3,460	5,500	25,700	20,340	10,400	8,710	3,460	1,610	830	1,610	1,780	1,120
8	3,460	13,600	115,000	18,330	9,360	7,780	3,660	1,610	830	1,610	1,610	1,120
9	3,460	46,600	72,600	18,330	8,400	7,170	7,780	1,440	830	1,440	1,440	1,120
10	3,460	26,900	41,400	34,400	7,470	7,170	11,150	1,280	830	1,440	1,440	1,120
11	3,460	18,330	26,900	37,200	7,170	7,470	29,950	1,280	830	1,440	1,610	1,120
12	3,460	14,500	20,850	28,700	6,580	7,470	21,870	1,120	1,280	1,280	1,610	1,120
13	3,460	10,770	17,340	24,600	6,020	6,300	15,420	1,120	1,440	1,610	1,610	970
14	3,460	9,030	14,960	21,360	5,250	5,760	11,940	1,280	1,280	2,510	1,780	970
15	3,270	9,690	13,600	17,340	6,580	5,010	9,030	1,280	1,280	3,080	1,780	970
16	3,270	9,030	11,150	14,500	7,780	5,500	7,780	1,280	1,440	2,890	1,610	970
17	3,080	8,400	10,040	14,500	7,470	6,870	6,580	970	1,280	2,700	1,610	970
18	3,080	8,090	9,030	14,050	7,170	6,020	5,250	970	1,280	2,510	1,610	830
19	3,080	7,470	9,690	13,600	12,340	5,500	4,300	970	1,120	2,320	1,610	830
20	3,080	6,580	11,540	11,540	27,500	4,770	4,070	1,120	970	2,140	1,610	830
21	2,890	6,300	20,850	10,400	24,600	4,770	3,460	1,280	970	2,320	1,440	830
22	3,080	6,020	21,870	9,360	18,330	6,580	3,080	1,280	830	3,080	1,440	830
23	27,500	5,760	21,360	8,400	14,500	8,710	2,700	1,960	830	3,460	1,440	830
24	70,700	8,710	42,100	7,470	12,340	9,690	2,700	2,140	830	3,270	1,610	970
25	41,400	10,400	45,000	7,170	11,150	7,170	2,510	2,510	830	3,080	1,440	970
26	23,400	9,030	53,000	8,400	10,400	6,020	2,320	2,140	970	3,080	1,440	970
27	15,420	6,580	64,300	10,770	9,690	4,770	2,320	1,960	1,440	2,890	1,440	1,120
28	13,170	5,760	47,400	14,050	9,030	4,300	2,320	1,610	2,140	2,700	1,440	3,660
29	8,090	5,250	29,300	22,380	8,090	3,860	2,320	1,440	2,140	2,700	1,280	7,640
30	7,170	......	22,890	31,800	7,470	3,460	2,140	1,440	2,320	2,510	1,280	8,010
31	8,400	......	18,330	......	7,470	......	2,140	1,280	......	2,320	......	4,220

Estimated monthly discharge of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904.

[Drainage area, 5,640 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1895.					
March	46,600	10,400	20,751	3.679	4.241
April	58,900	4,530	20.166	3.576	3.990
May	10,770	3,270	5,513	.978	1.128
June	19,330	830	3,480	.617	.688
July	11,540	410	2,946	.522	.602
August	3,660	600	1,898	.336	.387
September	3,660	410	1,030	.183	.204
October	970	410	746	.132	.152
November	6,870	500	1,462	.259	.289
December	23,400	830	4,523	.802	.924
The period	58,900	410	6,252	1.108	12.605
1896.					
January	22,380	2,700	5,705	1.012	1.167
February	49,000	3,080	10,861	1.926	2.077
March	76,500	4,070	13,809	2.448	2.822
April	67,900	8,710	20,118	3.567	3.980
May	8,090	2,140	3,853	.683	.787
June	23,400	2,510	7,454	1.322	1.475
July	22,380	3,270	6,276	1.113	1.283
August	22,890	1,280	6,382	1.132	1.305
September	4,070	970	1,560	.277	.309
October	49,000	1,610	13,137	2.329	2.685
November	26,300	4,300	8,770	1.554	1.734
December	13,600	2,700	6,245	1.107	1.276
The year	76,500	970	8,681	1.539	20.899

Estimated monthly discharge of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904—Continued.

[Drainage area, 5,640 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1897.					
January	9,360	2,890	4,955	0.878	1.012
February	34,400	3,080	9,495	1.684	1.754
March	53,000	6,870	25,589	4.537	5.231
April	34,400	5,760	13,869	2.459	2.744
May	34,400	4,070	14,294	2.534	2.921
June	5,010	2,140	3,046	.540	.602
July	12,750	1,610	3,409	.604	.696
August	8,090	1,780	3,712	.658	.759
September	5,010	600	1,706	.302	.337
October	1,960	970	1,286	.228	.263
November	16,850	1,120	6,716	1.191	1.329
December	27,500	4,070	11,475	2.034	2.345
The year	53,000	600	8,295	1.471	19.993
1898.					
January	42,100	3,460	15,799	2.801	3.230
February	31,800	4,300	12,211	2.165	2.254
March	162,600	6,020	31,357	5.560	6.410
April	33,700	5,760	12,900	2.287	2.552
May	19,830	6,300	10,536	1.868	2.154
June	8,090	2,140	4,289	.760	.848
July	4,070	1,280	2,056	.364	.420
August	22,380	1,960	4,467	.792	.914
September	2,330	1,120	1,529	.271	.302
October	35,800	1,280	7,372	1.307	1.507
November	38,600	3,660	8,513	1.509	1.684
December	31,100	2,700	7,590	1.346	1.552
The year	162,600	1,120	9,885	1.752	23.827

Estimated monthly discharge of West Branch of Susquehanna River at Williamsport, Pa., 1895-1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1899.					
January	29,300	6,580	12,005	2.128	2.453
February	31,100	4,770	9,303	1.649	1.717
March	68,800	15,420	27,500	4.876	5.622
April	28,100	6,870	15,693	2.782	3.104
May	25,100	4,070	7,484	1.327	1.530
June	5,010	1,280	2,724	.483	.539
July	3,460	970	1,748	.310	.357
August	5,250	600	1,335	.237	.273
September	3,080	970	1,845	.327	.365
October	1,280	710	1,008	.179	.206
November	9,030	1,120	5,744	1.018	1.136
December	26,300	3,080	9,258	1.641	1.892
The year	68,800	600	7,971	1.413	19.194
1900.					
January	67,900	5,250	13,934	2.470	2.848
February	41,400	6,020	14,095	2.499	2.602
March	35,800	5,250	15,639	2.773	3.197
April	22,890	8,400	13,992	2.481	2.768
May	9,690	3,460	4,923	.873	1.006
June	8,090	1,780	4,043	.717	.800
July	3,460	1,280	2,046	.363	.418
August	2,140	710	1,311	.232	.267
September	1,780	710	931	.165	.184
October	3,660	710	1,821	.323	.372
November	110,100	1,610	9,328	1.654	1.845
December	24,600	3,660	8,562	1.518	1.750
The year	110,100	710	7,551	1.339	18.057

Estimated monthly discharge of West Branch of Susquehanna River at Williamport, Pa., 1895–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1901.					
January	11,540	2,140	5,182	0.919	1.060
February	5,250	1,960	3,010	.534	.556
March	52,200	2,140	20,920	3.709	4.280
April	89,900	9,690	27,533	4.882	5.447
May	77,500	3,660	15,403	2.731	3.148
June	41,400	5,500	12,311	2.183	2.436
July	6,870	1,610	2,911	.516	.595
August	28,100	1,610	7,049	1.250	1.441
September	22,380	2,510	6,296	1.116	1.245
October	4,070	1,440	2,122	.376	.433
November	21,870	1,120	4,266	.756	.844
December	150,900	3,660	20,276	3.595	4.145
The year	150,900	1,120	10,606	1.881	25.630
1902.					
January	22,130	3,270	7,090	1.257	1.449
February	49,800	3,660	8,517	1.510	1.572
March	164,100	8,710	39,585	7.019	8.092
April	105,500	4,770	20,096	3.563	3.975
May	7,780	2,890	4,711	.835	.963
June	10,770	1,440	3,371	.598	.667
July	49,000	6,870	20,095	3.563	4.108
August	13,600	1,120	4,868	.863	.995
September	6,020	830	1,722	.305	.340
October	10,040	1,960	3,546	.629	.725
November	3,860	1,780	2,461	.436	.486
December	48,200	2,140	12,508	2.217	2.556
The year	164,100	830	10,714	1.899	25.928

Estimated monthly discharge of West Branch of Susquehanna River at Williamsport, Pa., 1895–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1903.					
January	50,600	4,530	9,948	1.763	2.032
February	93,100	8,400	24,459	4.337	4.516
March	110,700	11,150	35,220	6.245	7.200
April	56,300	5,760	17,825	3.160	3.526
May	5,010	1,960	2,938	.521	.601
June	37,200	1,280	7,929	1.407	1.569
July	29,300	4,070	9,747	1.728	1.992
August	24,600	2,890	6,019	1.067	1.230
September	17,340	2,320	5,890	1.044	1.165
October	28,100	1,960	8,313	1.474	1.699
November	58,900	2,510	8,773	1.555	1.735
December	5,010	2,140	3,519	.624	.719
The year	110,700	1,280	11,715	2.077	27.984
1904.					
January	70,700	2,890	9,477	1.68	1.94
February	46,600	5,010	10,320	1.83	1.97
March	135,100	5,760	36,070	6.40	7.38
April	107,800	7,170	23,760	4.21	4.70
May	28,100	5,250	12,080	2.14	2.47
June	18,830	3,460	7,170	1.27	1.42
July	29,950	2,140	6,219	1.10	1.27
August	2,510	970	1,541	.273	.315
September	2,320	830	1,170	.207	.231
October	3,460	1,280	2,309	.409	.472
November	2,140	1,280	1,648	.292	.326
December	8,010	1,120	1,660	.294	.339
The year	135,100	830	9,450	1.68	22.83

WEST BRANCH OF SUSQUEHANNA RIVER AT ALLENWOOD, PA.

Observations of height of water on the West Branch have been made by the Weather Bureau at Lock Haven, Pa., 47 miles above Allenwood. The drainage area is given as 3,740 square miles, and the width of river 1,125 feet. The gage is in two sections. The lower section is painted on the side wall of the canal lock and the upper is on the highway bridge over the river. The elevation of the zero is 555.7 feet. The highest water was 18 feet, on June 1, 1889, and the danger line is at 10 feet.

A gaging station was established on the West Branch by E. G. Paul on March 25, 1899, at Allenwood, Pa., 20 miles above the junction with the main stream. Measurements are made from the public highway bridge, one-fourth of a mile east of the railroad station at Allenwood. The wire gage is 42.15 feet from zero to the end of the weight, and is referred to a pine-board scale fastened to ironwork of the bridge and divided into feet and tenths. The initial point of soundings is at the end of the iron guard rail on the right bank. The channel is straight for one-half a mile above and below the station. The current is sluggish, but unobstructed. The banks are low and subject to overflow at time of high water. The bed of the stream is rocky and permanent. The observer is Frank L. Allen, a farmer, living 200 feet from the gage. A bench mark was established on September 24, 1900. It consists of a copper bolt set in the capstone of the wing wall on the lower side of the west end of the bridge, and is 33.19 feet above datum of the gage.

This station was discontinued in April, 1902, the station at Williamsport taking its place.

Discharge measurements of West Branch of Susquehanna River at Allenwood, Pa., 1899–1902.

Date.	Hydrographer.	Gage height.	Area of section.	Mean velocity.	Discharge.
1899.		*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
Mar. 24	E. G. Paul	7.00	7,885	4.06	32,031
June 8	do	3.00	3,367	1.18	3,988
July 28	do	2.05	2,625	.52	1,360
Sept. 15	do	1.90	2,437	.51	1,234
Oct. 17	do	1.70	2,137	.39	842
1900.					
May 18	E. G. Paul	3.20	3,729	1.29	4,812
Sept. 24	do	1.30	327	1.56	511
1901.					
Aug. 17	E. G. Paul	4.10	4,460	1.99	8,857
Oct. 26	do	2.30	2,824	.81	2,308
1902.					
Apr. 21	E. G. Paul	4.40	4,736	2.09	9,896

Mean daily gage height, in feet, of West Branch of Susquehanna River at Allenwood, Pa., 1899–1902.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	......	......	......	6.70	3.80	3.50	2.90	2.00	2.70	2.00	2.20	2.90
2	......	......	......	6.30	3.80	3.50	2.70	2.00	2.70	2.00	3.60	2.80
3	......	......	......	5.80	3.80	3.40	2.50	2.00	2.70	1.90	4.20	2.70
4	......	......	......	5.35	3.90	3.40	2.50	1.80	2.50	1.90	5.20	2.70
5	......	......	......	5.05	3.80	3.30	2.40	1.70	2.40	1.90	4.60	2.70
6	......	......	......	4.90	3.60	3.20	2.40	1.70	2.30	1.90	4.00	2.60
7	......	......	......	4.80	3.50	3.00	2.30	1.70	2.10	1.90	3.40	2.60
8	......	......	......	6.45	3.30	3.00	2.40	1.70	2.00	1.90	3.20	2.60
9	......	......	......	7.80	3.40	2.90	2.20	1.70	2.00	1.90	3.00	2.60
10	......	......	......	7.40	3.50	2.90	2.00	1.70	2.00	1.80	3.00	2.60
11	......	......	......	6.60	3.60	2.70	2.10	1.70	1.90	1.80	3.00	2.60
12	......	......	......	6.20	3.70	2.60	2.30	1.70	1.90	1.80	3.20	5.30
13	......	......	......	6.50	3.50	2.60	2.20	1.90	1.90	1.70	3.30	8.40
14	......	......	......	7.00	3.40	2.60	2.20	1.90	1.90	1.70	3.40	7.40
15	......	......	......	6.90	3.30	2.50	2.30	1.90	1.90	1.70	3.50	6.50
16	......	......	......	6.80	3.20	2.50	2.20	1.90	1.90	1.70	3.60	5.80
17	......	......	......	6.40	3.40	2.50	2.30	1.90	1.90	1.70	3.80	5.10
18	......	......	......	5.60	3.80	2.40	2.40	1.90	1.90	1.70	3.90	4.90
19	......	......	......	5.40	7.40	2.40	2.60	1.80	1.90	1.70	4.10	4.80
20	......	......	......	5.00	6.50	2.40	2.80	1.70	1.90	1.70	4.30	4.70
21	......	......	......	4.80	5.75	2.40	3.00	1.70	1.90	1.60	4.10	4.30
22	......	......	......	4.70	5.15	2.30	2.70	1.70	1.90	1.60	4.00	4.20
23	......	......	7.00	4.50	4.70	2.20	2.50	1.70	1.90	1.60	3.90	4.20
24	......	......	7.00	4.40	4.35	2.20	2.30	1.60	1.90	1.60	3.80	5.15
25	......	......	6.70	4.30	4.00	2.80	2.20	1.60	1.90	1.60	3.70	7.25
26	......	......	6.30	4.30	3.80	2.50	2.20	1.60	1.90	1.60	3.60	5.60
27	......	......	6.40	4.30	3.60	2.60	2.10	1.70	2.00	1.60	3.40	5.00
28	......	......	6.20	4.20	3.50	2.70	2.00	3.70	2.00	1.60	3.30	4.50
29	......	......	6.70	4.30	3.40	2.70	1.90	3.00	2.00	1.60	3.20	4.10
30	......	......	7.80	4.10	3.40	2.80	1.80	2.60	2.00	1.60	3.10	3.60
31	......	......	7.35	......	3.50	......	2.00	2.60	......	1.60	......	3.40
1900.												
1	4.50	3.20	7.55	5.00	4.30	3.90	2.10	1.90	2.00	1.30	2.10	5.75
2	5.50	3.20	9.60	5.30	4.20	3.90	2.30	1.80	1.90	1.30	2.10	5.40
3	5.70	3.40	7.70	5.40	4.20	3.90	2.60	1.80	1.90	1.20	2.10	5.00
4	5.80	3.40	7.00	5.80	4.00	4.00	2.50	1.80	1.80	1.20	2.10	5.80
5	5.90	3.50	6.00	5.90	3.80	4.10	2.30	1.70	1.80	1.20	2.10	5.90
6	5.90	3.60	5.40	6.20	3.50	3.90	2.30	1.70	1.70	1.20	2.00	6.40
7	5.90	3.80	5.80	6.40	3.30	3.60	2.20	1.70	1.70	1.20	1.90	6.70
8	4.70	4.50	5.90	6.20	3.30	3.50	2.20	1.60	1.70	1.20	1.90	6.00
9	3.70	5.00	6.10	7.30	3.20	3.40	2.20	1.60	1.60	1.80	1.90	5.50
10	3.90	5.30	6.40	6.00	3.20	3.30	2.30	1.50	1.60	2.20	1.90	4.90
11	4.20	5.60	6.90	5.70	3.20	3.20	2.50	1.40	1.60	2.20	1.90	4.60
12	4.50	5.30	6.20	5.30	3.20	3.00	2.70	1.50	1.50	2.10	1.90	4.20
13	4.40	6.00	5.40	4.90	3.50	3.00	2.90	1.50	1.50	2.10	1.90	4.00
14	4.20	7.70	5.00	4.80	3.40	3.00	2.80	1.40	1.40	2.10	1.90	3.80
15	4.00	7.30	4.00	4.80	3.40	3.00	2.60	1.40	1.40	2.10	1.90	3.60
16	4.00	6.50	4.00	4.60	3.30	3.00	2.60	1.40	1.40	2.10	1.80	3.30
17	4.00	6.20	3.90	4.70	3.20	2.90	2.50	1.40	1.30	2.10	1.80	3.20
18	4.20	5.40	3.80	6.00	3.20	2.80	2.40	1.40	1.30	2.20	1.80	3.20
19	4.50	5.60	3.70	7.00	3.50	2.70	2.20	1.40	1.30	2.10	1.70	3.10
20	5.30	5.90	6.20	6.90	3.50	2.70	2.00	1.40	1.30	2.00	1.70	3.10
21	13.20	6.00	7.10	6.30	3.30	2.60	2.00	1.40	1.30	1.90	1.70	3.10
22	12.20	8.20	6.90	6.20	3.20	2.50	1.90	2.30	1.30	1.90	1.90	3.00
23	8.50	10.15	6.60	6.00	3.00	2.40	1.90	2.30	1.30	2.10	2.40	3.00
24	6.50	7.85	6.10	6.30	3.00	2.40	1.90	2.30	1.30	2.20	3.00	3.00
25	6.30	6.50	5.90	6.00	3.00	2.30	1.90	2.30	1.30	2.40	5.00	3.00
26	6.10	5.00	5.50	5.60	3.00	2.30	1.90	2.30	1.30	2.50	7.70	3.00
27	5.30	5.00	5.20	5.30	3.40	2.30	2.20	2.20	1.30	2.60	15.75	3.00
28	4.60	4.80	5.10	4.80	3.20	2.20	2.20	2.20	1.30	2.40	10.05	3.00
29	4.60	......	5.00	4.60	3.00	2.20	2.20	2.10	1.30	2.40	8.25	3.00
30	4.50	......	4.90	4.40	3.00	2.10	2.20	2.10	1.30	2.30	6.60	3.00
31	3.20	......	4.80	......	3.20	......	2.00	2.00	......	2.20	......	......

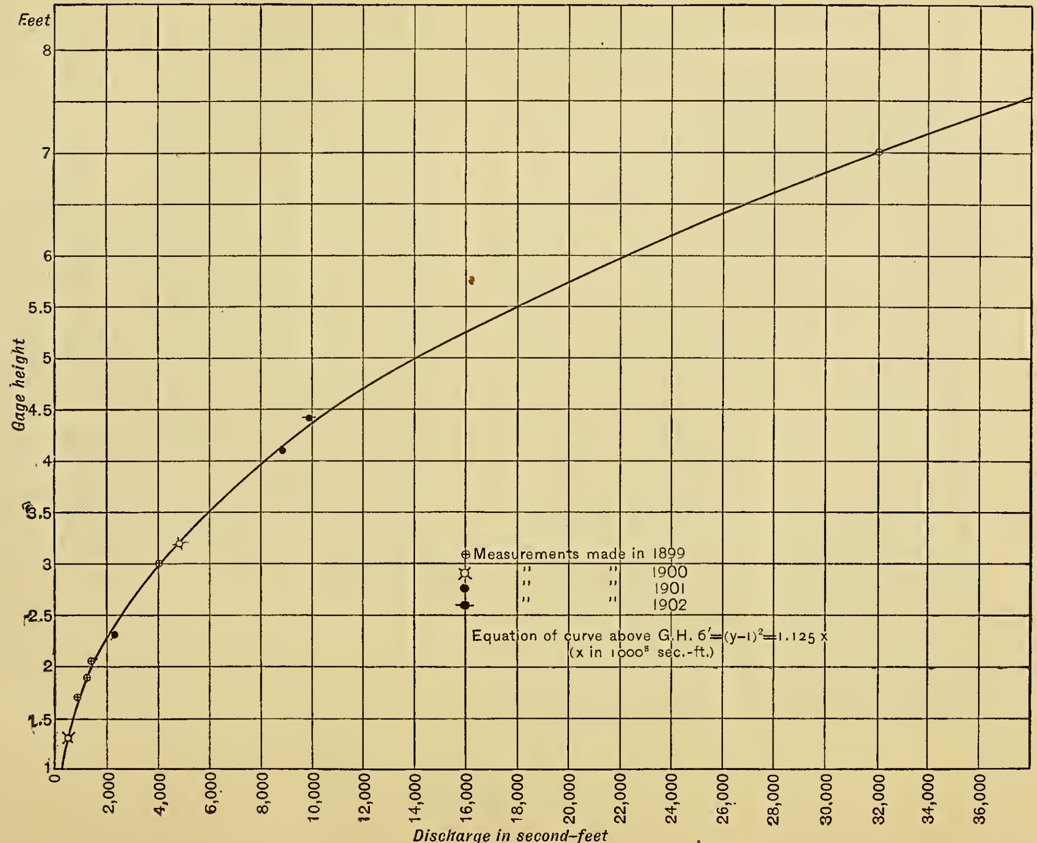
Mean daily gage height, in feet, of West Branch of Susquehanna River at Allenwood, Pa., 1899–1902—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	3.00	2.50	3.00	5.80	4.70	8.50	2.90	2.50	4.10	3.30	2.40	4.00
2	3.00	2.50	3.00	5.60	4.60	7.70	2.90	2.40	4.20	3.20	2.60	3.90
3	3.00	2.50	2.90	5.20	5.00	7.20	2.80	2.40	4.20	3.10	2.80	3.70
4	3.00	2.50	3.00	6.50	5.20	6.70	2.80	2.30	4.30	3.10	3.00	3.60
5	3.00	2.60	3.50	6.80	5.00	5.70	2.80	2.20	4.40	3.00	3.10	3.40
6	2.80	2.80	4.80	7.00	4.90	5.00	2.70	2.20	4.40	3.10	3.10	3.40
7	2.70	3.00	5.20	9.15	4.70	5.70	2.70	2.30	4.20	3.20	2.20	3.20
8	2.50	2.50	5.50	10.00	4.60	5.90	2.70	2.50	4.10	3.30	2.40	5.00
9	2.50	3.00	5.80	11.15	4.40	6.00	2.70	3.10	3.90	3.40	2.40	7.20
10	2.90	3.50	4.80	9.30	4.00	5.90	2.70	3.00	3.90	3.40	3.40	6.50
11	3.40	4.00	9.50	8.30	4.20	5.60	2.70	2.90	3.80	3.60	3.60	6.30
12	3.80	4.00	9.70	7.00	4.30	5.20	2.60	2.80	3.80	3.60	3.40	6.20
13	4.50	3.80	9.10	6.80	4.30	5.00	2.60	2.80	3.80	3.70	3.30	5.90
14	4.90	4.20	8.50	6.40	4.40	4.90	2.50	2.70	3.80	3.40	3.20	8.00
15	4.50	4.00	7.40	6.30	4.50	4.80	2.50	2.70	3.60	3.20	3.20	20.15
16	4.20	3.80	6.80	5.80	4.50	4.40	2.50	2.60	3.70	3.00	3.10	17.70
17	4.00	3.50	6.20	5.40	4.70	4.30	2.40	4.10	3.80	2.90	3.10	11.30
18	4.00	3.20	5.80	5.20	4.60	4.10	2.40	4.30	3.90	2.80	3.00	7.40
19	3.90	3.00	7.20	5.10	4.80	4.00	2.20	4.50	3.80	2.70	3.00	7.00
20	3.50	3.00	8.00	6.30	4.40	4.00	2.20	4.70	3.60	2.50	2.90	5.90
21	3.20	3.20	8.00	11.45	4.20	3.90	2.10	4.60	3.50	2.40	2.80	5.40
22	3.00	3.00	8.00	14.35	4.20	3.80	2.10	6.40	3.50	2.30	2.60	5.10
23	3.00	3.90	8.00	11.65	5.20	3.70	2.00	7.90	3.30	2.30	2.40	4.80
24	2.80	3.00	7.60	10.20	6.20	3.50	2.00	7.70	3.30	2.30	5.00	4.50
25	2.50	3.00	7.20	9.30	5.80	3.30	2.00	6.80	3.20	2.30	6.70	4.40
26	2.50	3.00	9.40	8.50	6.00	3.30	2.00	6.20	3.20	2.30	5.90	4.30
27	2.50	3.00	11.20	7.40	6.40	3.10	2.20	5.70	3.00	2.30	5.50	4.20
28	2.50	3.00	11.20	5.80	7.10	3.10	2.20	4.80	2.80	2.20	4.80	4.10
29	2.50	....	8.70	5.30	11.15	2.90	2.40	4.30	2.70	2.20	4.00	4.10
30	2.50	....	7.00	5.00	13.00	2.90	2.50	4.20	2.80	2.20	4.20	4.00
31	2.50	....	6.60	....	10.40	....	2.50	4.10	....	2.30	....	3.90
1902.												
1	3.80	5.40	21.60	6.40	....	....	....	....	....	....	....	....
2	3.80	5.20	19.40	6.50	....	....	....	....	....	....	....	....
3	3.60	4.90	15.50	6.50	....	....	....	....	....	....	....	....
4	3.60	4.90	11.50	6.40	....	....	....	....	....	....	....	....
5	3.50	4.90	8.20	5.80	....	....	....	....	....	....	....	....
6	3.50	4.90	6.80	(a)	....	....	....	....	....	....	....	....
7	3.50	4.80	6.40	....	....	....	....	....	....	....	....	....
8	3.50	4.80	5.50	....	....	....	....	....	....	....	....	....
9	3.40	4.80	4.90	....	....	....	....	....	....	....	....	....
10	3.40	4.80	6.40	....	....	....	....	....	....	....	....	....
11	3.40	4.80	7.60	....	....	....	....	....	....	....	....	....
12	3.30	4.70	8.40	....	....	....	....	....	....	....	....	....
13	3.20	4.70	10.00	....	....	....	....	....	....	....	....	....
14	3.20	4.60	8.90	....	....	....	....	....	....	....	....	....
15	3.20	4.50	8.60	....	....	....	....	....	....	....	....	....
16	3.20	4.70	8.80	....	....	....	....	....	....	....	....	....
17	3.20	4.70	12.20	....	....	....	....	....	....	....	....	....
18	3.10	4.70	10.00	....	....	....	....	....	....	....	....	....
19	3.10	4.70	8.60	....	....	....	....	....	....	....	....	....
20	3.10	4.70	7.40	....	....	....	....	....	....	....	....	....
21	3.40	4.70	6.70	....	....	....	....	....	....	....	....	....
22	7.40	4.70	6.40	....	....	....	....	....	....	....	....	....
23	6.80	6.50	5.70	....	....	....	....	....	....	....	....	....
24	6.60	7.00	5.40	....	....	....	....	....	....	....	....	....
25	6.50	7.40	5.20	....	....	....	....	....	....	....	....	....
26	6.30	5.50	4.80	....	....	....	....	....	....	....	....	....
27	6.20	5.90	4.70	....	....	....	....	....	....	....	....	....
28	5.90	9.70	5.00	....	....	....	....	....	....	....	....	....
29	5.90	....	5.60	....	....	....	....	....	....	....	....	....
30	5.80	....	6.10	....	....	....	....	....	....	....	....	....
31	5.40	....	6.20	....	....	....	....	....	....	....	....	....

[a] Discontinued.

Rating table for West Branch of Susquehanna River at Allenwood, Pa., for 1900 to 1902.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1.2	430	3.5	5,970	5.8	20,500	9.2	59,800
1.3	510	3.6	6,400	5.9	21,350	9.4	62,700
1.4	600	3.7	6,830	6.0	22,200	9.6	65,700
1.5	690	3.8	7,260	6.1	23,100	9.8	68,800
1.6	790	3.9	7,700	6.2	24,000	10.0	72,000
1.7	900	4.0	8,160	6.3	24,900	10.2	75,300
1.8	1,040	4.1	8,630	6.4	25,900	10.4	78,600
1.9	1,220	4.2	9,110	6.5	26,900	10.6	82,000
2.0	1,410	4.3	9,610	6.6	27,900	10.8	85,500
2.1	1,610	4.4	10,140	6.7	28,900	11.0	89,000
2.2	1,830	4.5	10,710	6.8	29,900	11.2	92,600
2.3	2,070	4.6	11,300	6.9	31,000	11.4	96,300
2.4	2,320	4.7	11,930	7.0	32,000	11.6	100,000
2.5	2,580	4.8	12,600	7.2	34,200	11.8	103,800
2.6	2,850	4.9	13,300	7.4	36,500	12.0	107,600
2.7	3,130	5.0	14,030	7.6	38,800	12.2	111,500
2.8	3,420	5.1	14,780	7.8	41,200	12.4	115,500
2.9	3,730	5.2	15,550	8.0	43,600	12.6	119,500
3.0	4,050	5.3	16,350	8.2	46,100	12.8	123,700
3.1	4,400	5.4	17,170	8.4	48,700	13.0	128,000
3.2	4,770	5.5	17,990	8.6	51,400		
3.3	5,150	5.6	18,820	8.8	54,100		
3.4	5,550	5.7	19,650	9.0	56,900		



RATING CURVE FOR WEST BRANCH OF SUSQUEHANNA RIVER AT ALLENWOOD, PA.

Mean daily discharge, in second-feet, of West Branch of Susquehanna River at Allenwood, Pa., 1899–1902.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	....	....	....	28,900	7,260	5,970	3,730	1,410	3,130	1,410	1,830	3,730
2	....	....	....	24,900	7,260	5,970	3,130	1,410	3,130	1,410	6,400	3,420
3	....	....	....	20,500	7,260	5,550	2,580	1,410	3,130	1,220	9,110	3,130
4	....	....	....	16,760	7,700	5,550	2,580	1,040	2,580	1,220	15,550	3,130
5	....	....	....	14,400	7,260	5,150	2,320	900	2,320	1,220	11,300	3,130
6	....	....	....	13,300	6,400	4,770	2,320	900	2,070	1,220	8,160	2,850
7	....	....	....	12,600	5,970	4,050	2,070	900	1,610	1,220	5,550	2,850
8	....	....	....	26,400	5,150	4,050	2,320	900	1,410	1,220	4,770	2,850
9	....	....	....	41,200	5.550	3,730	1,830	900	1,410	1,220	4,050	2,850
10	....	....	....	36,500	5,970	3,730	1,410	900	1,410	1,040	4,050	2,850
11	....	....	....	27,900	6,400	3,130	1,610	900	1,220	1,040	4,050	2,850
12	....	....	....	24,000	6,830	2,850	2,070	900	1,220	1,040	4,770	16,350
13	....	....	....	26,900	5,970	2,850	1,830	1,220	1,220	900	5,150	48,700
14	....	....	....	32,000	5,550	2,850	1,830	1,228	1,220	900	5,550	36,500
15	....	....	....	31,000	5,150	2,580	2,070	1,220	1,220	900	5,970	26,900
16	....	....	....	29,900	4,700	2,580	1,830	1,220	1,220	900	6,400	20,500
17	....	....	....	25,900	5,550	2,580	2,070	1,220	1,220	900	7,260	14,780
18	....	....	....	18,820	7,260	2,320	2,320	1,220	1,220	900	7,700	13,300
19	....	....	....	17,170	36,500	2,320	2,850	1,040	1,220	900	8,630	12,600
20	....	....	....	14,030	26,900	2,320	3,420	900	1,220	900	9,610	11,930
21	....	....	....	12,600	20,075	2,320	4,050	900	1,220	790	8,630	9,610
22	....	....	....	11,930	15,160	2,070	3,130	900	1,220	790	8,160	9,110
23	....	....	32,000	10,710	11,930	1,830	2,580	900	1,220	790	7,700	9,110
24	....	....	32,000	10,140	9,870	1,830	2,070	790	1,220	790	7,260	15,160
25	....	....	28,900	9,610	8,160	3,420	1,830	790	1,220	790	6,830	34,700
26	....	....	24,900	9,610	7,260	2,580	1,830	790	1,220	790	6,400	18,820
27	....	....	25,900	9,610	6,400	2,850	1,610	900	1,410	790	5,550	14,030
28	....	....	24,000	9,110	5,970	3,130	1,410	6,830	1,410	790	5,150	10,710
29	....	....	28,900	9,610	5,550	3,130	1,220	4,050	1,410	790	4,770	8,630
30	....	....	41,200	8,630	5,550	3,420	1,040	2,850	1,410	790	4,400	6,400
31	....	....	35,900	....	5,970	....	1,410	2,850	....	790	....	5,550
1900.												
1	10,710	4,770	38,200	14,030	9,610	7,700	1,610	1,220	1,410	510	1,610	20,070
2	17,990	4,770	65,700	16,350	9,110	7,700	2,070	1,040	1,220	510	1,610	17,170
3	19,650	5,550	40,000	17,170	9,110	7,700	2,850	1,040	1,220	430	1,610	14,030
4	20,500	5,550	32,000	20,500	8,160	8,160	2,580	1,040	1,040	430	1,610	20,500
5	21,350	5,970	22,200	21,350	7,260	8,630	2,070	900	1,040	430	1,610	21,350
6	21,350	6,400	17,170	24,000	5,970	7,700	2,070	900	900	430	1,410	25,900
7	21,350	7,260	20,500	25,900	5,150	6,400	1,830	900	900	430	1,220	28,900
8	11,930	10,710	21,350	24,000	5,150	5,970	1,830	790	900	430	1,220	22,200
9	6,830	14,030	23,100	35,300	4,770	5,550	1,830	790	790	1,040	1,220	17,990
10	7,700	16,350	25,900	22,200	4,770	5,150	2,070	690	790	1,830	1,220	13,300
11	9,190	18,820	31,000	19,650	4,770	4,770	2,580	600	790	1,830	1,220	11,300
12	10,710	16,350	24,000	16,350	4,770	4,050	3,130	690	690	1,610	1,220	9,110
13	10,140	22,200	17,170	13,300	5,970	4,050	3,730	690	690	1,610	1,220	8,160
14	9,110	40,000	14,030	12,600	5,550	4,050	3,420	600	600	1,610	1,220	7,260
15	8,160	35,300	8,160	12,600	5,550	4,050	2,850	600	600	1,610	1,220	6,400
16	8,160	26,900	8,160	11,300	5,150	4,050	2,850	600	600	1,610	1,040	5,150
17	8,160	24,000	7,700	11,930	4,770	3,730	2,580	600	510	1,610	1,040	4,770
18	9,110	17,170	7,260	22,200	4,770	3,420	2,320	600	510	1,830	1,040	4,770
19	10,710	18,820	6,830	32,000	5,970	3,130	1,830	600	510	1,610	900	4,400
20	16,350	21,350	24,000	31,000	5,970	3,130	1,410	600	510	1,410	900	4,400
21	132,300	22,200	33,100	24,900	5,150	2,850	1,410	600	510	1,220	900	4,400
22	111,500	46,100	31,000	24,000	4,770	2,580	1,220	2,070	510	1,220	1,220	4,050
23	50,000	74,500	27,900	22,200	4,050	2,320	1,220	2,070	510	1,610	2,320	4,050
24	26,900	41,800	23,100	24,900	4,050	2,320	1,220	2,070	510	1,830	4,050	4,050
25	24,900	26,900	21,300	22,200	4,050	2,070	1,220	2,070	510	2,320	14,030	4,050
26	23,100	14,030	17,990	18,820	4,050	2,070	1,220	2,070	510	2,580	40,000	4,050
27	16,350	14,030	15,550	16,350	5,550	2,070	1,830	1,830	510	2,580	193,400	4,050
28	11,300	12,600	14,780	12,600	4,770	1,830	1,830	1,830	510	2,320	72,800	4,050
29	11,300	....	14,030	11,300	4,050	1,830	1,830	1,610	510	2,320	46,750	4,050
30	10,710	....	13,300	10,140	4,050	1,610	1,830	1,610	510	2,070	27,900	4,050
31	4,770	....	12,600	....	4,770	....	1,410	1,410	....	1,830	....	....

Mean daily discharge, in second-feet, of West Branch of Susquehanna River at Allenwood, Pa., 1899–1902—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	4,050	2,580	4,050	20,500	11,930	50,000	3,730	2,580	8,630	5,150	2,320	8,160
2	4,050	2,580	4,050	18,820	11,300	40,000	3,730	2,320	9,110	4,770	2,850	7,700
3	4,050	2,580	3,730	15,550	14,030	34,200	3,420	2,320	9,110	4,400	3,420	6,830
4	4,050	2,580	4,050	26,900	15,550	28,900	3,420	2,070	9,610	4,400	4,050	6,400
5	4,050	2,850	5,970	29,900	14,030	19,650	3,420	1,830	10,140	4,050	4,400	5,550
6	3,420	3,420	12,600	32,000	13,300	14,030	3,130	1,830	10,140	4,400	4,400	5,550
7	3,130	4,050	15,550	59,000	11,930	19,650	3,130	2,070	9,110	4,770	1,830	4,770
8	2,580	2,580	17,990	72,000	11,300	21,350	3,130	2,580	8,630	5,150	2,320	14,030
9	2,580	4,050	20,500	91,700	10,140	22,200	3,130	4,400	7.700	5,550	2,320	34,200
10	3,730	5,970	12,600	61,200	8,160	21,350	3,130	4,050	7,700	5,550	5,550	26,900
11	5,550	8,160	64,200	47,400	9,110	18,820	3,130	3,730	7,260	6,400	6,400	24,900
12	7,260	8,160	67,200	32,000	9,610	15,550	2,850	3,420	7,260	6,400	5,550	24,000
13	10,710	7,260	58,300	29,900	9,610	14,030	2,850	3,420	7,260	6,830	5,150	21,350
14	13,300	9,110	50,000	25,900	10,140	13,300	2,580	3,130	7,260	5,550	4,770	43,600
15	10,710	8,160	36,500	24,900	10,710	12,600	2,580	3,130	6,400	4,770	4,770	326,000
16	9,110	7,260	29,900	20,500	10,710	10,140	2,580	2,850	6,830	4,050	4,400	247,900
17	8,160	5,970	24,000	17,170	11,930	9,610	2,320	8,630	7,260	3,730	4,400	94,400
18	8,160	4,770	20,500	15,550	11,300	8,630	2,320	9,610	7,700	3,420	4,050	36,500
19	7,700	4,050	34,200	14,780	12,600	8,160	1,830	10,710	7,260	3,130	4,050	32,000
20	5,970	4,050	43,600	24,900	10,140	8,160	1,830	11,930	6,400	2,580	3,730	21,350
21	4,770	4,770	43,600	97,200	9,110	7,700	1,610	11,300	5,970	2,320	3,420	17,170
22	4,050	4,050	43,600	158,400	9,110	7,260	1,610	25,900	5,970	2,070	2,850	14,780
23	4,050	7,700	43,600	101,000	15,550	6,830	1,410	42,400	5,150	2,070	2,320	12,600
24	3,420	4,050	38,800	75,300	24,000	5,970	1,410	40,000	5,150	2,070	14,030	10,710
25	2,580	4,050	34,200	61,200	20,500	5,150	1,410	29,900	4,770	2,070	28,900	10,140
26	2,580	4,050	62,700	50,000	22,200	5,150	1,410	24,000	4,770	2,070	21,350	9,610
27	2,580	4,050	92,600	36,500	25,900	4,400	1,830	19,650	4,050	2,070	17,990	9,110
28	2,580	4,050	92,600	20,500	33,100	4,400	2,320	12,600	3,420	1,830	12,600	8,630
29	2,580	......	52,700	16,350	91,700	3,730	2,320	9,610	3,130	1,830	8,160	8,630
30	2,580	......	32,000	14,030	128,000	3,730	2,580	9,110	3,420	1,830	9,110	8,160
31	2,580	......	27,900	......	78,600	......	2,580	8,630	......	2,070	......	7,700
1902.												
1	7,260	17,170	377,200	25,900	......	......	......	......	......	......	......	......
2	7,260	15,550	300,900	26,900	......	......	......	......	......	......	......	......
3	6,400	13,300	186,900	26,900	......	......	......	......	......	......	......	......
4	6,400	13,300	98,100	25,900	......	......	......	......	......	......	......	......
5	5,970	13,300	46,100	20,500	......	......	......	......	......	......	......	......
6	5,970	13,300	29,900	......	......	......	......	......	......	......	......	......
7	5,970	12,600	25,900	......	......	......	......	......	......	......	......	......
8	5,970	12,600	17,990	......	......	......	......	......	......	......	......	......
9	5,550	12,600	13,300	......	......	......	......	......	......	......	......	......
10	5,550	12,600	25,900	......	......	......	......	......	......	......	......	......
11	5,550	12,600	38,800	......	......	......	......	......	......	......	......	......
12	5,150	11,930	48,700	......	......	......	......	......	......	......	......	......
13	4,770	11,930	72,000	......	......	......	......	......	......	......	......	......
14	4,770	11,300	55,500	......	......	......	......	......	......	......	......	......
15	4,770	10,710	51,400	......	......	......	......	......	......	......	......	......
16	4,770	11,930	54,100	......	......	......	......	......	......	......	......	......
17	4,770	11,930	111,500	......	......	......	......	......	......	......	......	......
18	4,400	11,930	72,000	......	......	......	......	......	......	......	......	......
19	4,400	11,930	51,400	......	......	......	......	......	......	......	......	......
20	4,400	11,930	36,500	......	......	......	......	......	......	......	......	......
21	5,550	11,930	28,900	......	......	......	......	......	......	......	......	......
22	36,500	11,930	25,900	......	......	......	......	......	......	......	......	......
23	29,900	26,900	19,650	......	......	......	......	......	......	......	......	......
24	27,900	32,000	17,170	......	......	......	......	......	......	......	......	......
25	26,900	36,500	15,550	......	......	......	......	......	......	......	......	......
26	24,900	17,990	12,600	......	......	......	......	......	......	......	......	......
27	24,000	21,350	11,930	......	......	......	......	......	......	......	......	......
28	21,350	67,200	14,030	......	......	......	......	......	......	......	......	......
29	21,350	......	18,820	......	......	......	......	......	......	......	......	......
30	20,500	......	23,100	......	......	......	......	......	......	......	......	......
31	17,170	......	24,000	......	......	......	......	......	......	......	......	......

Estimated monthly discharge of West Branch of Susquehanna River at Allenwood, Pa., 1899–1902.

[Drainage area, 6,538 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1899.					
March (23–31)	41,200	24,000	30,411	4.651	1.557
April	41,200	8,630	19,488	2.981	3.326
May	36,500	4,770	8,985	1.374	1.584
June	5,970	1,830	3,383	.517	.577
July	4,050	1,040	2,205	.337	.388
August	6,830	790	1,428	.218	.251
September	3,130	1,220	1,579	.242	.270
October	1,410	790	980	.150	.173
November	15,550	4,050	6,690	1.023	1.141
December	48,700	2,850	12,162	1.860	2.144
The period	48,700	790	8,731	1.335	11.411
1900.					
January	132,300	4,770	22,007	3.366	3.881
February	74,500	4,770	20,515	3.138	3.268
March	65,700	6,830	21,907	3.351	3.863
April	35,300	10,140	19,705	3.014	3.363
May	9,610	4,050	5,536	.847	.976
June	8,630	1,610	4,355	.666	.743
July	3,730	1,220	2,056	.314	.362
August	2,070	600	1,120	.171	.197
September	1,410	510	711	.109	.122
October	2,850	430	1,451	.222	.256
November	193,400	900	14,291	2.186	2.439
December	28,900	4,050	10,266	1.570	1.752
The year	193,400	430	10,327	1.578	21.222

Estimated monthly discharge of West Branch of Susquehanna River at Allenwood, Pa., 1899-1902—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1901.					
January	13,300	2,580	5,054	0.773	0.891
February	9,110	2,580	4,891	.748	.779
March	92,600	3,730	35,284	5.397	6.222
April	158,400	14,030	43,702	6.684	7.457
May	128,000	8,160	22,106	3.381	3.898
June	50,000	3,730	14,822	2.267	2.529
July	3,730	1,410	2,524	.386	.445
August	42,400	1,830	10,313	1.577	1.818
September	10,140	3,130	6,886	1.053	1.175
October	6,830	1,830	3,785	.579	.668
November	28,900	1,830	6,715	1.027	1.146
December	326,000	4,770	35,785	5.473	6.310
The year	326,000	1,410	15,989	2.445	33.591
1902.					
January	36,500	4,400	11,809	1.806	2.082
February	67,200	10,710	17,151	2.623	2.731
March	377,200	11,930	61,798	9.452	10.897

JUNIATA RIVER AT NEWPORT, PA.

Juniata River rises in Center County, Pa., and flows in a general southeasterly direction into Susquehanna River 15 miles above Harrisburg. Its drainage area is mountainous and for the most part covered with forest growth.

This station was established at Newport, about 15 miles above the mouth of Juniata River, March 21, 1899, by E. G. Paul. The standard boxed chain gage was located on the covered wagon bridge which was 800 feet east of the public square at Newport, Pa. It was attached to the bridge timbers inside of the bridge near the right bank. The length of the chain from the end of the weight to the marker was 39.54 feet. The gage is read once each day by A. R. Bortel. Bench mark No. 1 is on the extreme east end of the stone doorsill, south front of Butz's store building, near end of bridge; its elevation is 28.83 feet above gage datum. Bench mark No. 2 is on shelf in southeast corner of underpinning of store of J. M. Ewing; its elevation is 27.37 feet above gage datum. This bench mark was set by the Pennsylvania Railroad, and according to their records its elevation is 390.69 feet above sea level. Discharge measurements were made from the lower side of the four-span wagon bridge to which the gage was attached. The initial point for soundings was the end of the woodwork of the bridge on the right bank downstream side. In the fall of 1904 this bridge was replaced by a steel structure. During its construction the stage of the river was obtained by means of a temporary gage staff attached to the exposed end of a sewer near the bridge. This gage was set at the same elevation as the old one. As soon as the bridge is completed a standard chain gage will be put in place. The channel is straight for one-half mile above and below the station. Both banks are high and are not subject to overflow. There is a single channel, broken by three bridge piers. The piers do not interfere with the flow of the stream and there is little eddying and boiling near them. The bed is of hard material and is probably permanent. There is a good measurable velocity at all stages.

Discharge measurements of Juniata River at Newport, Pa., 1899–1904.

Date.	Hydrographer.	Gage height.	Area of section.	Mean velocity.	Discharge.
1899.		*Feet.*	*Sq. feet.*	*Ft. per sec.*	*Sec. feet.*
Mar. 21	E. G. Paul	6.60	3,486	3.75	13,094
June 9	do	3.20	1,158	1.64	1,903
July 31	do	2.90	849	.80	682
Sept. 14	do	4.55	1,755	2.64	4,625
Oct. 18	do	2.90	661	1.25	829
1900.					
May 17	E. G. Paul	3.40	1,139	1.56	1,778
Sept. 22	do	2.80	723	.58	418
1901.					
Aug. 14	E. G. Paul	3.40	1,080	1.77	1,915
Oct. 24	do	3.10	881	1.46	1,288
1902.					
Apr. 19	E. G. Paul	5.00	2,093	3.24	6,779
Sept. 17	do	2.84	702	1.05	734
1903.					
Mar. 9	E. C. Murphy	6.21	2,978	3.64	10,843
Apr. 2	do	6.21	2,988	3.53	10,555
May 7	do	3.96	1,409	3.10	2,963
June 3	J. C. Hoyt	3.40	1,102	1.38	1,525
Oct. 6	W. C. Sawyer	3.40	1,044	1.58	1,655
Nov. 3	Brundage and Sawyer	3.33	1,062	1.51	1,604
1904.					
July 16	N. C. Grover	4.28	1,520	2.73	4.152

Mean daily gage height, in feet, of Juniata River at Newport, Pa., 1899–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	-------	-------	-------	7.00	3.40	3.11	2.70	3.00	3.50	3.20	2.70	3.30
2	-------	-------	-------	6.10	3.40	3.60	2.70	3.00	3.50	3.10	4.00	3.30
3	-------	-------	-------	5.50	3.60	3.50	2.60	3.00	3.40	3.10	4.90	3.30
4	-------	-------	-------	5.10	3.70	3.40	2.50	3.00	3.40	3.10	4.60	3.30
5	-------	-------	-------	4.90	3.50	3.30	3.00	3.00	3.20	3.00	4.20	3.30
6	-------	-------	-------	4.50	3.40	3.40	3.00	3.00	3.30	3.00	3.90	3.20
7	-------	-------	-------	4.30	3.40	3.30	3.00	3.30	3.30	3.00	3.70	3.10
8	-------	-------	-------	5.60	3.40	3.20	3.00	3.50	3.30	3.00	3.50	3.10
9	-------	-------	-------	7.80	3.60	3.20	3.10	3.30	3.30	2.90	3.50	3.10
10	-------	-------	-------	6.90	3.60	2.80	3.30	3.20	3.30	2.90	3.40	3.10
11	-------	-------	-------	5.80	4.00	2.80	3.30	3.10	3.30	2.90	3.30	3.10
12	-------	-------	-------	5.50	4.10	2.80	3.30	3.10	3.40	2.90	3.30	3.70
13	-------	-------	-------	5.10	4.00	2.80	3.10	3.40	4.80	2.90	3.30	4.80
14	-------	-------	-------	4.90	3.80	2.70	3.10	3.10	4.80	2.90	3.20	5.50
15	-------	-------	-------	4.80	3.80	2.70	3.10	3.10	3.80	2.90	3.20	5.10
16	-------	-------	-------	4.70	3.60	2.70	3.00	3.00	3.50	2.90	3.20	4.80
17	-------	-------	-------	5.50	3.70	2.70	2.90	3.00	3.30	2.90	3.20	4.30
18	-------	-------	-------	4.40	4.10	2.70	2.90	3.00	3.10	2.90	3.10	4.00
19	-------	-------	-------	4.30	8.00	2.60	2.90	3.00	3.10	2.90	3.10	4.00
20	-------	-------	-------	4.10	7.30	2.60	3.00	3.10	3.10	2.90	3.10	3.70
21	-------	-------	6.50	4.00	7.60	2.60	3.00	3.00	3.10	2.90	3.10	3.70
22	-------	-------	6.00	3.90	5.10	2.60	3.00	3.00	3.10	2.90	3.10	5.00
23	-------	-------	5.70	3.80	4.70	2.50	3.00	2.90	3.10	2.80	3.10	5.00
24	-------	-------	6.00	3.80	4.40	2.50	3.00	2.90	3.10	2.80	3.40	5.00
25	-------	-------	5.50	3.70	4.00	2.50	3.00	2.90	3.10	2.80	4.00	5.80
26	-------	-------	5.20	3.60	3.70	2.50	3.00	2.90	3.10	2.80	4.00	5.50
27	-------	-------	5.10	3.60	3.70	2.50	2.80	2.90	3.10	2.80	3.80	4.50
28	-------	-------	5.10	3.60	3.70	2.50	2.90	4.40	3.20	2.80	3.60	4.30
29	-------	-------	8.80	3.50	3.70	2.70	2.90	4.10	3.30	2.80	3.50	4.10
30	-------	-------	10.30	3.40	4.10	2.70	2.90	5.00	3.30	2.70	3.40	4.10
31	-------	-------	8.30	-------	3.11	-------	2.90	4.40	-------	2.70	-------	4.10
1900.												
1	4.10	3.70	5.90	4.50	4.10	3.30	3.30	3.00	3.30	2.80	3.00	4.40
2	4.10	3.40	12.90	4.50	4.10	3.30	3.20	3.00	3.20	2.90	3.00	4.10
3	4.60	3.40	8.00	4.50	4.00	3.40	3.10	3.00	3.20	2.90	3.00	3.90
4	5.00	3.50	6.00	4.40	3.90	3.70	3.10	3.00	3.10	2.90	3.00	3.90
5	5.00	3.80	5.50	4.50	3.80	3.60	3.10	3.00	2.90	2.90	2.90	5.50
6	4.70	4.40	5.40	4.60	3.70	3.40	3.10	3.00	2.90	2.90	2.90	7.00
7	5.20	4.10	6.00	4.50	3.70	3.40	3.10	2.90	2.90	2.90	3.00	6.30
8	4.00	4.20	6.40	4.40	3.70	3.30	3.10	2.90	2.80	2.90	3.00	5.20
9	4.20	5.10	5.60	4.40	3.60	3.40	3.10	2.90	2.80	2.90	3.00	4.60
10	4.10	5.60	5.40	4.40	3.60	3.50	3.10	2.80	2.80	2.90	3.00	4.50
11	4.10	4.80	5.10	4.40	3.50	3.40	3.10	2.80	2.80	2.90	2.90	4.30
12	4.80	4.60	5.10	4.30	3.50	3.30	3.10	2.80	2.80	3.00	2.90	4.20
13	4.60	5.40	4.90	4.30	3.50	3.30	3.10	2.80	2.80	3.00	2.90	4.00
14	4.20	9.40	4.80	4.30	3.50	3.30	3.00	2.80	2.80	3.00	2.90	3.80
15	3.90	7.60	4.70	4.30	3.50	3.30	3.00	2.80	2.80	3.00	3.00	3.70
16	3.50	5.90	4.60	4.10	3.50	3.30	3.00	2.80	2.80	3.00	3.00	3.70
17	4.10	5.30	4.10	4.00	3.40	3.30	3.00	2.80	2.80	3.00	3.00	3.60
18	3.80	4.90	4.10	4.00	3.40	3.30	3.00	2.80	2.80	3.00	3.00	3.30
19	4.20	4.10	4.10	4.40	3.50	3.30	2.90	2.80	2.80	3.00	3.00	3.50
20	4.90	4.20	4.40	4.70	3.70	3.30	2.90	2.80	2.80	3.00	3.00	3.70
21	10.60	4.40	6.50	4.50	4.00	3.30	2.90	2.80	2.80	3.00	3.00	3.80
22	10.20	11.70	6.50	4.50	3.70	3.30	2.90	2.80	2.80	3.00	3.00	3.80
23	7.20	11.10	5.70	4.50	3.70	3.30	2.90	2.80	2.80	2.90	3.10	3.60
24	6.00	8.20	5.70	4.70	3.60	3.30	3.20	2.80	2.80	3.70	3.10	3.40
25	5.20	5.90	5.60	4.70	3.50	3.20	3.10	3.30	2.80	3.40	4.00	3.80
26	5.00	4.50	5.40	4.70	3.50	3.20	3.10	3.30	2.80	3.30	6.30	3.50
27	4.80	4.40	5.10	4.40	3.20	3.60	3.10	3.70	2.80	3.30	11.60	3.30
28	4.40	4.60	5.00	4.30	3.30	3.40	3.10	3.40	2.80	3.20	8.00	3.20
29	4.40	-------	4.80	4.20	3.30	3.30	3.10	3.30	2.80	3.20	5.70	3.20
30	4.20	-------	4.60	4.20	3.30	3.30	3.00	3.70	2.80	3.10	4.80	3.20
31	4.10	-------	4.50	-------	3.30	-------	3.00	3.60	-------	3.00	-------	3.20

Mean daily gage height, in feet, of Juniata River at Newport, Pa., 1899–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	3.40	3.40	3.50	5.10	4.80	8.80	4.10	3.50	5.40	3.60	3.00	3.60
2	3.30	3.30	3.50	4.90	4.70	7.70	4.20	3.50	5.40	3.40	3.00	3.50
3	3.30	3.30	3.60	4.90	4.50	7.10	4.20	3.50	5.20	3.50	3.00	4.20
4	3.10	3.40	3.60	7.60	4.60	6.10	[a] 4.00	3.30	5.00	3.50	3.00	4.20
5	3.30	3.80	4.40	9.00	4.50	5.20	[a] 3.90	3.10	4.60	3.50	3.00	4.20
6	3.40	4.30	4.80	10.50	4.40	5.00	[a] 3.80	3.10	4.20	3.40	3.00	4.20
7	3.20	4.30	4.70	11.00	4.20	4.90	[a] 3.70	4.50	4.00	3.30	3.00	4.20
8	3.60	4.30	4.40	10.90	4.10	5.30	[a] 3.60	6.20	3.90	3.20	3.00	3.70
9	3.30	4.30	4.20	9.50	4.00	5.10	[a] 3.50	5.00	3.70	3.20	3.00	4.20
10	3.20	4.30	5.00	7.90	4.20	4.60	[a] 3.40	4.10	3.60	3.10	3.00	5.00
11	3.20	4.00	15.90	7.00	4.70	4.50	3.30	4.00	3.70	3.10	3.00	7.00
12	3.50	3.80	15.40	6.20	4.80	4.50	3.30	3.70	4.10	3.20	3.00	6.20
13	3.80	3.80	10.40	5.80	4.80	4.50	3.30	3.50	4.00	3.30	3.00	5.10
14	3.80	4.30	7.80	5.40	4.70	4.50	3.40	3.40	3.80	3.40	3.00	5.20
15	3.80	3.80	7.20	5.20	4.60	4.40	3.40	3.40	3.80	3.40	3.00	18.00
16	3.80	3.80	6.50	5.60	4.40	4.40	3.50	3.40	3.80	3.30	3.00	18.00
17	3.80	3.60	5.80	5.60	4.10	4.50	4.90	3.40	3.70	3.30	3.00	10.80
18	3.80	3.50	5.50	5.40	4.20	5.00	5.00	4.10	3.80	3.30	3.00	13.65
19	3.80	3.50	5.10	5.40	4.10	4.60	5.20	4.30	3.90	3.20	3.00	6.30
20	3.80	3.50	5.00	5.40	4.10	4.40	4.80	5.30	3.70	3.20	3.00	5.30
21	3.80	3.50	5.90	10.50	4.10	4.30	4.10	4.10	3.60	3.10	3.00	12.05
22	3.90	3.50	6.90	13.80	4.50	4.60	3.80	4.10	3.50	3.10	3.00	4.10
23	4.10	3.60	6.50	11.50	13.00	5.30	3.70	4.10	3.40	3.10	3.00	4.40
24	3.70	3.70	5.80	9.00	9.50	5.60	3.50	5.50	3.20	3.10	3.80	4.40
25	3.50	3.90	5.50	7.60	9.00	5.00	3.40	5.50	3.30	3.00	4.90	4.60
26	3.40	3.40	5.30	6.80	10.60	4.60	3.70	5.10	3.30	3.00	4.80	4.80
27	3.70	3.40	5.50	6.00	8.60	4.40	3.50	4.90	3.20	3.00	4.00	4.50
28	3.70	3.50	6.60	5.60	10.30	4.20	3.50	4.30	3.20	3.00	4.00	4.50
29	3.60	-------	6.50	5.30	12.60	4.00	3.40	4.20	3.50	3.00	3.90	5.20
30	3.50	-------	5.90	5.00	13.30	4.00	3.40	4.30	3.50	3.00	3.70	6.40
31	3.60	-------	5.40	-------	11.60	-------	3.40	4.30	-------	3.00	-------	7.70
1902.												
1	6.40	4.20	25.30	5.80	4.00	3.20	5.40	4.40	3.00	4.90	4.00	3.60
2	5.60	4.20	19.50	5.70	3.80	3.20	6.30	4.00	3.00	4.90	3.80	3.60
3	5.00	4.60	15.50	5.40	3.80	3.20	6.10	3.50	2.90	3.50	3.70	4.30
4	5.40	3.90	12.00	5.30	3.90	3.20	6.40	4.00	2.90	3.50	3.60	5.30
5	4.30	4.50	9.30	5.00	3.90	3.20	6.70	4.00	2.90	3.50	3.60	5.50
6	4.20	3.60	7.10	5.00	3.90	3.20	5.60	4.00	2.90	4.00	3.50	4.90
7	4.20	3.60	6.50	5.20	3.90	3.20	5.40	3.80	2.90	4.00	3.40	4.50
8	4.20	3.70	6.00	14.65	3.90	3.10	5.00	3.80	2.90	3.80	3.30	4.50
9	4.10	5.10	5.50	18.50	3.90	3.10	4.50	3.80	2.90	3.50	3.40	4.20
10	4.10	5.80	6.20	18.50	3.90	3.10	4.80	4.00	3.10	3.40	3.40	4.40
11	4.10	5.80	8.40	12.50	3.70	3.10	4.60	4.60	3.10	3.40	3.40	4.20
12	4.00	5.70	9.50	10.00	3.50	3.10	4.00	3.90	3.00	4.60	3.30	5.30
13	3.90	5.00	13.30	8.10	3.50	3.20	3.90	3.80	3.00	6.40	3.30	7.70
14	3.90	4.50	14.10	7.00	3.30	3.30	3.90	3.60	2.90	6.00	3.30	4.80
15	3.70	4.30	9.60	6.50	3.30	3.30	3.80	3.30	2.90	4.70	3.30	6.40
16	3.50	5.10	9.00	5.50	3.30	4.30	3.60	3.40	2.90	4.40	3.20	5.80
17	3.80	5.10	15.30	5.00	3.40	3.80	3.60	3.40	2.90	4.00	3.20	7.70
18	3.80	5.10	12.50	5.00	3.40	3.90	3.60	3.30	2.90	3.80	3.20	7.00
19	7.50	5.10	9.50	4.90	3.40	3.50	3.60	3.30	2.80	3.80	3.20	6.40
20	4.00	4.90	8.00	4.70	3.40	3.30	3.50	3.20	2.90	3.50	3.20	5.70
21	4.00	4.80	6.50	4.60	3.40	3.40	3.60	3.10	2.90	3.40	3.20	6.20
22	9.50	4.80	6.00	4.50	3.40	3.10	3.70	3.20	2.80	3.30	3.20	9.50
23	8.20	4.90	5.50	4.40	3.40	3.10	3.60	3.10	2.80	3.40	3.20	10.80
24	6.20	4.40	5.50	4.30	3.40	3.10	3.50	3.30	2.80	3.30	3.20	8.60
25	5.00	4.50	5.10	4.20	3.40	3.10	4.10	3.20	3.00	3.20	3.20	7.40
26	4.60	9.00	5.00	4.10	3.40	4.00	3.80	3.20	3.30	3.20	3.30	6.30
27	5.70	9.90	4.80	3.80	3.60	3.80	3.50	2.90	4.20	3.20	3.50	5.80
28	7.50	14.90	4.50	3.80	3.40	3.90	3.50	4.30	3.60	3.80	3.70	5.30
29	5.60	-------	4.20	4.00	3.30	3.90	3.60	4.70	3.50	5.70	3.80	4.80
30	5.00	-------	5.80	4.10	3.30	4.70	4.20	3.30	3.50	5.00	3.80	4.70
31	4.50	-------	6.00	-------	3.20	-------	4.20	2.90	-------	4.40	-------	4.70

[a] Estimated.

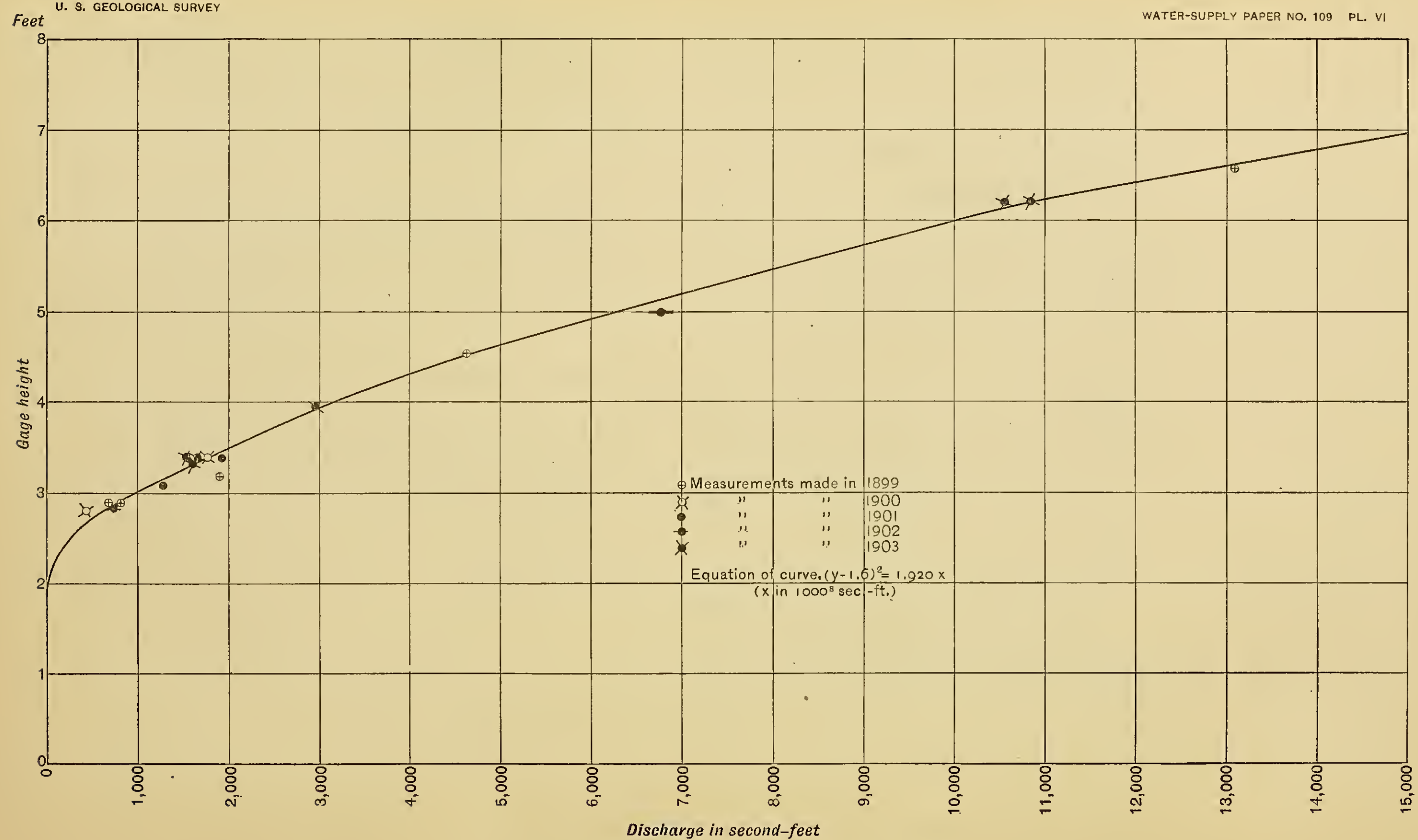
Mean daily gage height, in feet, of Juniata River at Newport, Pa., 1899-1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	4.60	8.20	15.50	7.00	3.80	3.50	9.50	3.50	6.10	3.40	3.50	3.30
2	5.30	6.90	12.10	6.30	3.80	3.40	6.10	3.50	5.60	3.40	3.50	3.30
3	5.30	6.70	9.00	5.60	4.10	3.40	5.20	3.40	5.10	3.30	3.30	3.20
4	7.90	10.10	7.50	5.20	4.10	3.40	4.80	3.40	4.50	3.30	3.30	3.20
5	7.50	14.50	6.70	5.20	4.00	3.30	4.50	3.50	4.30	3.30	3.30	3.20
6	6.60	11.50	6.30	5.10	4.00	3.30	5.00	3.50	4.20	3.40	3.30	3.20
7	6.00	8.50	6.00	4.80	4.00	3.30	9.50	3.80	4.10	3.40	3.30	3.20
8	5.00	7.10	5.80	5.30	3.80	4.00	6.80	4.00	4.00	3.90	3.30	3.20
9	5.50	6.50	6.40	5.60	3.80	4.20	5.40	3.80	4.30	3.80	3.30	3.30
10	4.70	5.80	6.90	5.80	3.80	4.20	4.90	3.70	5.00	5.40	3.30	3.35
11	4.30	5.30	6.60	5.60	3.70	4.30	4.50	3.50	4.70	4.80	3.30	3.30
12	4.00	6.10	6.30	5.40	3.60	4.30	4.40	3.50	4.90	4.50	3.30	3.10
13	3.80	6.60	5.90	5.50	3.60	5.00	4.50	3.40	4.60	4.20	3.30	3.10
14	4.40	6.30	5.50	6.60	3.60	4.70	4.40	3.30	4.20	4.10	3.30	3.20
15	4.50	5.90	5.30	13.10	3.50	4.80	4.40	3.30	4.00	3.90	3.30	3.30
16	4.30	5.80	5.00	15.60	3.50	4.70	4.20	4.20	3.90	3.90	3.30	3.20
17	4.40	10.20	4.90	14.00	3.50	4.60	4.00	3.90	3.90	3.80	3.40	3.20
18	4.30	7.90	4.90	9.40	3.50	4.30	5.00	3.50	4.30	4.20	3.50	3.50
19	4.40	6.70	4.70	8.00	3.50	4.10	7.50	3.50	4.60	4.40	3.50	3.70
20	4.30	6.00	4.50	7.10	3.50	4.10	6.00	3.40	4.10	4.20	3.60	3.70
21	4.90	5.40	4.50	6.50	3.50	4.10	5.20	3.40	4.00	4.00	3.70	3.90
22	4.90	5.40	4.70	5.80	3.50	4.30	4.70	3.50	3.90	3.90	3.60	3.90
23	4.80	5.40	5.80	5.40	3.50	4.30	4.40	3.50	3.80	3.80	3.50	3.90
24	4.80	5.00	12.70	5.20	3.50	4.80	4.30	3.30	3.70	3.70	3.50	3.90
25	4.80	5.30	12.20	4.90	3.50	6.00	4.10	3.40	3.60	[a]3.60	3.50	3.90
26	4.60	5.10	8.50	4.80	3.40	5.60	3.90	3.40	3.50	[a]3.60	3.40	3.90
27	4.40	5.00	7.10	4.80	3.50	5.00	3.80	3.50	3.50	3.50	3.40	3.90
28	4.40	8.90	6.30	4.30	3.50	4.50	3.80	3.50	3.50	3.50	3.40	3.90
29	5.30	-------	5.60	4.10	3.50	4.60	3.70	3.70	3.40	3.50	3.30	3.90
30	8.00	-------	5.50	4.10	3.50	4.90	3.50	8.00	3.40	3.50	3.30	3.90
31	10.20	-------	6.20	-------	3.50	-------	3.50	6.70	-------	3.50	-------	4.20
1904.												
1	4.20	4.00	7.50	6.70	6.70	4.90	3.70	3.30	3.00	2.90	2.90	2.50
2	4.20	5.00	12.00	13.40	6.10	5.60	3.70	3.30	3.00	2.90	2.90	2.80
3	4.50	5.00	7.20	9.40	5.70	6.00	3.70	3.70	3.00	2.90	2.90	2.90
4	4.60	5.00	13.50	7.70	5.30	5.40	3.70	3.60	3.00	2.90	2.90	3.20
5	4.60	8.00	8.90	6.70	5.00	5.90	3.70	3.60	3.00	2.90	2.90	2.90
6	4.60	8.50	6.00	5.70	4.80	5.90	3.70	3.50	3.00	2.90	2.80	3.10
7	4.60	11.50	5.50	5.70	4.70	5.40	4.40	3.90	2.90	2.90	2.80	3.20
8	4.50	[a]8.50	14.00	5.30	4.60	4.70	5.10	3.50	2.90	2.90	2.80	3.20
9	4.50	6.50	10.00	5.30	4.50	4.60	5.80	3.30	3.00	2.90	2.80	3.20
10	4.50	5.00	7.20	6.30	4.40	4.50	7.20	3.30	3.00	2.90	2.80	3.10
11	4.40	4.60	6.00	6.30	4.30	5.10	8.70	3.20	3.00	2.90	2.90	3.10
12	4.20	4.20	6.00	6.00	4.20	4.60	7.10	3.20	3.00	2.90	2.90	3.10
13	4.10	4.00	5.20	5.70	4.20	4.40	5.50	3.10	3.00	2.90	2.90	3.10
14	4.10	3.90	5.20	5.30	4.20	4.20	5.30	3.10	2.90	2.90	2.90	3.10
15	4.10	4.10	5.00	5.00	4.20	4.00	4.70	3.10	2.90	2.90	2.90	3.10
16	4.10	4.20	4.80	4.80	4.20	4.00	4.70	3.10	3.00	2.90	2.90	3.10
17	4.00	4.40	4.50	4.80	4.20	4.40	4.10	3.00	3.00	2.90	2.90	3.10
18	4.00	5.00	4.50	4.70	4.30	3.90	3.90	3.20	3.00	2.90	2.90	3.10
19	4.00	4.60	4.80	4.40	4.50	3.90	3.80	3.10	3.00	2.90	2.90	3.10
20	4.00	4.70	4.50	4.40	6.70	3.90	3.90	3.20	2.90	2.90	2.80	3.10
21	4.00	4.70	5.80	4.30	5.90	3.70	3.70	3.20	2.90	3.30	2.80	3.10
22	4.00	5.00	5.50	4.20	5.50	5.70	3.60	3.20	2.90	3.30	2.80	3.10
23	5.40	5.00	5.80	4.20	4.90	5.50	3.50	3.20	2.90	3.20	2.80	3.10
24	[b]11.00	5.40	8.00	4.00	4.60	5.30	3.80	3.20	2.90	3.10	2.70	3.20
25	7.00	7.20	7.50	4.00	4.50	4.40	3.80	3.10	2.90	3.10	2.70	3.20
26	5.50	7.40	6.90	4.00	4.60	4.00	3.70	3.10	2.90	3.00	2.70	3.20
27	4.50	5.90	6.20	4.20	4.70	3.50	3.70	3.00	2.90	2.90	2.70	3.50
28	4.10	4.80	6.20	4.60	4.50	3.80	3.50	3.00	2.90	2.90	2.60	3.70
29	3.80	4.50	5.60	6.50	4.40	3.70	3.40	3.10	2.90	2.90	2.60	3.80
30	3.70	-------	5.20	7.50	4.20	3.70	3.30	3.10	2.90	2.90	2.50	3.80
31	3.80	-------	5.00	-------	4.60	-------	3.30	3.00	-------	2.90	-------	3.80

[a] Interpolated. [b] Ice moved out.

Rating table for Juniata River at Newport, Pa., from 1899 to 1904.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
2.5	230	4.7	5,180	6.9	14,570	10.2	38,500
2.6	320	4.8	5,510	7.0	15,170	10.4	40,300
2.7	430	4.9	5,850	7.1	15,770	10.6	42,200
2.8	570	5.0	6,200	7.2	16,370	10.8	44,100
2.9	750	5.1	6,550	7.3	16,970	11.0	46,000
3.0	950	5.2	6,910	7.4	17,570	11.2	48,000
3.1	1,160	5.3	7,270	7.5	18,170	11.4	50,100
3.2	1,370	5.4	7,640	7.6	18,770	11.6	52,200
3.3	1,580	5.5	8,010	7.7	19,380	11.8	54,300
3.4	1,790	5.6	8,390	7.8	20,000	12.0	56,400
3.5	2,000	5.7	8,770	7.9	20,640	12.2	58,600
3.6	2,210	5.8	9,150	8.0	21,300	12.4	60,800
3.7	2,430	5.9	9,540	8.2	22,700	12.6	63,100
3.8	2,650	6.0	9,930	8.4	24,100	12.8	65,400
3.9	2,880	6.1	10,330	8.6	25,500	13.0	67,700
4.0	3,120	6.2	10,740	8.8	27,000	13.2	70,100
4.1	3,380	6.3	11,200	9.0	28,500	13.4	72,600
4.2	3,650	6.4	11,720	9.2	30,100	13.6	75,100
4.3	3,930	6.5	12,270	9.4	31,700	13.8	77,600
4.4	4,220	6.6	12,830	9.6	33,400		
4.5	4,530	6.7	13,400	9.8	35,100		
4.6	4,850	6.8	13,980	10.0	36,800		



RATING CURVE FOR JUNIATA RIVER AT NEWPORT, PA.

Mean daily discharge, in second-feet, of Juniata River at Newport, Pa., 1899–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	-------	-------	-------	15,170	1,790	1,160	430	950	2,000	1,370	430	1,580
2	-------	-------	-------	10,330	1,790	2,210	430	950	2,000	1,160	3,120	1,580
3	-------	-------	-------	8,010	2,210	2,000	320	950	1,790	1,160	5,850	1,580
4	-------	-------	-------	6,550	2,430	1,790	230	950	1,790	1,160	4,850	1,580
5	-------	-------	-------	5,850	2,000	1,580	950	950	1,370	950	3,650	1,580
6	-------	-------	-------	4,530	1,790	1,790	950	950	1,580	950	2,880	1,370
7	-------	-------	-------	3,930	1,790	1,580	950	1,580	1,580	950	2,430	1,160
8	-------	-------	-------	8,390	1,790	1,370	950	2,000	1,580	950	2,000	1,160
9	-------	-------	-------	20,000	2,210	1,370	1,160	1,580	1,580	750	2,000	1,160
10	-------	-------	-------	14,570	2,210	570	1,580	1,370	1,580	750	1,790	1,160
11	-------	-------	-------	9,150	3,120	570	1,580	1,160	1,580	750	1,580	1,160
12	-------	-------	-------	8,010	3,380	570	1,580	1,160	1,790	750	1,580	2,430
13	-------	-------	-------	6,550	3,120	570	1,160	1,790	5,510	750	1,580	5,510
14	-------	-------	-------	5,850	2,650	430	1,160	1,160	5,510	750	1,370	8,010
15	-------	-------	-------	5,510	2,650	430	1,160	1,160	2,650	750	1,370	6,550
16	-------	-------	-------	5,180	2,210	430	950	950	2,000	750	1,370	5,510
17	-------	-------	-------	8,010	2,430	430	750	950	1,580	750	1,370	3,930
18	-------	-------	-------	4,220	3,380	430	750	950	1,160	750	1,160	3,120
19	-------	-------	-------	3,930	21,300	320	750	950	1,160	750	1,160	3,120
20	-------	-------	-------	3,380	16,970	320	950	1,160	1,160	750	1,160	2,430
21	-------	-------	12,270	3,120	18,770	320	950	950	1,160	750	1,160	2,430
22	-------	-------	9,930	2,880	6,550	320	950	950	1,160	750	1,160	6,200
23	-------	-------	8,770	2,650	5,180	230	950	750	1,160	570	1,160	6,200
24	-------	-------	9,930	2,650	4,220	230	950	750	1,160	570	1,790	6,200
25	-------	-------	8,010	2,430	3,120	230	950	750	1,160	570	3,120	9,150
26	-------	-------	6,910	2,210	2,430	230	950	750	1,160	570	3,120	8,010
27	-------	-------	6,550	2,210	2,430	230	570	750	1,160	570	2,650	4,530
28	-------	-------	6,550	2,210	2,430	230	750	4,220	1,370	570	2,210	3,930
29	-------	-------	27,000	2,000	2,430	430	750	3,380	1,580	570	2,000	3,380
30	-------	-------	39,400	1,790	3,380	430	750	6,200	1,580	430	1,790	3,380
31	-------	-------	23,400	-------	1,160	-------	750	4,220	-------	430	-------	3,380
1900.												
1	3,380	2,430	9,540	4,530	3,380	1,580	1,580	950	1,580	570	950	4,220
2	3,380	1,790	66,500	4,530	3,380	1,580	1,370	950	1,370	750	950	3,380
3	4,850	1,790	21,300	4,530	3,120	1,790	1,160	950	1,370	750	950	2,880
4	6,200	2,000	9,930	4,220	2,880	2,430	1,160	950	1,160	750	950	2,880
5	6,200	2,650	8,010	4,530	2,650	2,210	1,160	950	750	750	750	8,010
6	5,180	4,220	7,640	4,850	2,430	1,790	1,160	950	750	750	750	15,170
7	6,910	3,380	9,930	4,530	2,430	1,790	1,160	750	750	750	950	11,200
8	3,120	3,650	11,720	4,220	2,430	1,580	1,160	750	570	750	950	6,910
9	3,650	6,550	8,390	4,220	2,210	1,790	1,160	750	570	750	950	4,850
10	3,380	8,390	7,640	4,220	2,210	2,000	1,160	570	570	750	950	4,530
11	3,380	5,510	6,550	4,220	2,000	1,790	1,160	570	570	750	750	3,930
12	5,510	4,850	6,550	3,930	2,000	1,580	1,160	570	570	950	750	3,650
13	4,850	7,640	5,850	3,930	2,000	1,580	1,160	570	570	950	750	3,120
14	3,650	31,700	5,510	3,930	2,000	1,580	950	570	570	950	750	2,650
15	2,880	18,770	5,180	3,930	2,000	1,580	950	570	570	950	950	2,430
16	2,000	9,540	4,850	3,380	2,000	1,580	950	570	570	950	950	2,430
17	3,380	7,270	3,380	3,120	1,790	1,580	950	570	570	950	950	2,210
18	2,650	5,850	3,380	3,120	1,790	1,580	950	570	570	950	950	1,580
19	3,650	3,380	3,380	4,220	2,000	1,580	750	570	570	950	950	2,000
20	5,850	3,650	4,220	5,180	2,430	1,580	750	570	570	950	950	2,430
21	42,200	4,220	12,270	4,530	3,120	1,580	750	570	570	950	950	2,650
22	38,500	53,200	12,270	4,530	2,430	1,580	750	570	570	950	950	2,650
23	16,370	47,000	8,770	4,530	2,430	1,580	750	570	570	750	1,160	2,210
24	9,930	22,700	8,770	5,180	2,210	1,580	1,370	570	570	2,430	1,160	1,790
25	6,910	9,540	8,390	5,180	2,000	1,370	1,160	1,580	570	1,790	3,120	2,650
26	6,200	4,530	7,640	5,180	2,000	1,370	1,160	1,580	570	1,580	11,200	2,000
27	5,510	4,220	6,550	4,220	1,370	2,210	1,160	2,430	570	1,580	52,200	1,580
28	4,220	4,850	6,200	3,930	1,580	1,790	1,160	1,790	570	1,370	21,300	1,370
29	4,220	-------	5,510	3,650	1,580	1,580	1,160	1,580	570	1,370	8,770	1,370
30	3,650	-------	4,850	3,650	1,580	1,580	950	2,430	570	1,160	5,510	1,370
31	3,380	-------	4,530	-------	1,580	-------	950	2,210	-------	950	-------	1,370

Mean daily discharge, in second-feet, of Juniata River, at Newport, Pa., 1899–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	1,790	1,790	2,000	6,550	5,510	27,000	3,380	2,000	7,640	2,210	950	2,210
2	1,580	1,580	2,000	5,850	5,180	19,380	3,650	2,000	7,640	1,790	950	2,000
3	1,580	1,580	2,210	5,850	4,530	15,770	3,650	2,000	6,910	2,000	950	3,650
4	1,160	1,790	2,210	18,770	4,850	10,330	3,120	1,580	6,200	2,000	950	3,650
5	1,580	2,650	4,220	28,500	4,530	6,910	2,880	1,160	4,850	2,000	950	3,650
6	1,790	3,930	5,510	41,200	4,220	6,200	2,650	1,160	3,650	1,790	950	3,650
7	1,370	3,930	5,180	46,000	3,650	5,850	2,430	4,530	3,120	1,580	950	3,650
8	2,210	3,930	4,220	45,000	3,380	7,270	2,210	10,740	2,880	1,370	950	2,430
9	1,580	3,930	3,650	32,500	3,120	6,550	2,000	6,200	2,430	1,370	950	3,650
10	1,370	3,930	6,200	20,640	3,650	4,850	1,790	3,380	2,210	1,160	950	6,200
11	1,370	3,120	106,500	15,170	5,180	4,530	1,580	3,120	2,430	1,160	950	15,170
12	2,000	2,650	99,200	10,740	5,510	4,530	1,580	2,430	3,380	1,370	950	10,740
13	2,650	2,650	40,300	9,150	5,510	4,530	1,580	2,000	3,120	1,580	950	6,550
14	2,650	3,930	20,000	7,640	5,180	4,530	1,790	1,790	2,650	1,790	950	6,910
15	2,650	2,650	16,370	6,910	4,850	4,220	1,790	1,790	2,650	1,790	950	140,100
16	2,650	2,650	12,270	8,390	4,220	4,220	2,000	1,790	2,650	1,580	950	140,100
17	2,650	2,210	9,150	8,390	3,380	4,530	5,850	1,790	2,430	1,580	950	44,100
18	2,650	2,000	8,010	7,640	3,650	6,200	6,200	3,380	2,650	1,580	950	75,000
19	2,650	2,000	6,550	7,640	3,380	4,850	6,910	3,930	2,880	1,370	950	11,200
20	2,650	2,000	6,200	7,640	3,380	4,220	5,510	7,270	2,430	1,370	950	7,270
21	2,650	2,000	9,540	41,200	3,380	3,930	3,380	3,380	2,210	1,160	950	57,000
22	2,880	2,000	14,570	77,600	4,530	4,850	2,650	3,380	2,000	1,160	950	3,380
23	3,380	2,210	12,270	51,100	67,700	7,270	2,430	3,380	1,790	1,160	950	4,220
24	2,430	2,430	9,150	28,500	32,500	8,390	2,000	8,010	1,370	1,160	2,650	4,220
25	2,000	2,880	8,010	18,770	28,500	6,200	1,790	8,010	1,580	950	5,850	4,850
26	1,790	1,790	7,270	13,980	42,200	4,850	2,430	6,550	1,580	950	5,510	5,510
27	2,430	1,790	8,010	9,930	25,500	4,220	2,000	5,850	1,370	950	3,120	4,530
28	2,430	2,000	12,830	8,393	39,400	3,650	2,000	3,930	1,370	950	3,120	4,530
29	2,210	-------	12,270	7,270	63,100	3,120	1,790	3,650	2,000	950	2,880	6,910
30	2,000	-------	9,540	6,200	71,300	3,120	1,790	3,930	2,000	950	2,430	11,720
31	2,210	-------	7,640	-------	52,200	-------	1,790	3,930	-------	950	-------	19,380
1902.												
1	11,720	3,650	292,500	9,150	3,120	1,370	7,640	4,220	950	5,850	3,120	2,210
2	8,390	3,650	166,900	8,770	2,650	1,370	11,200	3,120	950	5,850	2,650	2,210
3	6,200	4,850	100,600	7,640	2,650	1,370	10,330	2,000	750	2,000	2,430	3,930
4	7,640	2,880	56,400	7,270	2,880	1,370	11,720	3,120	750	2,000	2,210	7,270
5	3,930	4,530	30,900	6,200	2,880	1,370	13,400	3,120	750	2,000	2,210	8,010
6	3,650	2,210	15,770	6,200	2,880	1,370	8,390	3,120	750	3,120	2,000	5,850
7	3,650	2,210	12,270	6,910	2,880	1,370	7,640	2,650	750	3,120	1,790	4,530
8	3,650	2,430	9,930	88,700	2,880	1,160	6,200	2,650	750	2,650	1,580	4,530
9	3,380	6,550	8,010	148,800	2,880	1,160	4,530	2,650	750	2,000	1,790	3,650
10	3,380	9,150	10,740	148,800	2,880	1,160	5,510	3,120	1,160	1,790	1,790	4,220
11	3,380	9,150	24,100	61,900	2,430	1,160	4,850	4,850	1,160	1,790	1,790	3,650
12	3,120	8,770	32,500	36,800	2,000	1,160	3,120	2,880	950	4,850	1,580	7,270
13	2,880	6,200	71,300	22,000	2,000	1,370	2,880	2,650	950	11,720	1,580	19,380
14	2,880	4,530	81,400	15,170	1,580	1,580	2,880	2,210	750	9,930	1,580	5,510
15	2,430	3,930	33,400	12,270	1,580	1,580	2,650	1,580	750	5,180	1,580	11,720
16	2,000	6,550	28,500	8,010	1,580	3,930	2,210	1,790	750	4,220	1,370	9,150
17	2,650	6,550	97,700	6,200	1,790	2,650	2,210	1,790	750	3,120	1,370	19,380
18	2,650	6,550	61,900	6,200	1,790	2,880	2,210	1,580	750	2,650	1,370	15,170
19	18,170	6,550	32,500	5,850	1,790	2,000	2,210	1,580	570	2,650	1,370	11,720
20	3,120	5,850	21,300	5,180	1,790	1,580	2,000	1,370	750	2,000	1,370	8,770
21	3,120	5,510	12,270	4,850	1,790	1,790	2,210	1,160	750	1,790	1,370	10,740
22	32,500	5,510	9,930	4,530	1,790	1,160	2,430	1,370	570	1,580	1,370	32,500
23	22,700	5,850	8,010	4,220	1,790	1,160	2,210	1,160	570	1,790	1,370	44,100
24	10,740	4,220	8,010	3,930	1,790	1,160	2,000	1,580	570	1,580	1,370	25,500
25	6,200	4,530	6,550	3,650	1,790	1,160	3,380	1,370	950	1,370	1,370	17,570
26	4,850	28,500	6,200	3,380	1,790	3,120	2,650	1,370	1,580	1,370	1,580	11,200
27	8,770	35,900	5,510	2,650	2,210	2,650	2,000	750	3,650	1,370	2,000	9,150
28	18,170	92,100	4,530	2,650	1,790	2,880	2,000	3,930	2,210	2,650	2,430	7,270
29	8,390	-------	3,650	3,120	1,580	2,880	2,210	5,180	2,000	8,770	2,650	5,510
30	6,200	-------	9,150	3,380	1,580	5,180	3,650	1,580	2,000	6,200	2,650	5,180
31	4,530	-------	9,930	-------	1,370	-------	3,650	750	-------	4,220	-------	5,180

Mean daily discharge, in second-feet, of Juniata River at Newport, Pa., 1899–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	4,850	22,700	100,600	15,170	2,650	2,000	32,500	2,000	10,330	1,790	2,000	1,580
2	7,270	14,570	57,500	11,200	2,650	1,790	10,330	2,000	8,390	1,790	2,000	1,580
3	7,270	13,400	28,500	8,390	3,380	1,790	6,910	1,790	6,550	1,580	1,580	1,370
4	20,640	37,600	18,170	6,910	3,380	1,790	5,510	1,790	4,530	1,580	1,580	1,370
5	18,170	86,700	13.400	6,910	3,120	1,580	4,530	2,000	3,930	1,580	1,580	1,370
6	12,830	51,100	11,200	6,550	3,120	1,580	6,200	2,000	3,650	1,790	1,580	1,370
7	9,930	24,800	9,930	5,510	3,120	1,580	32,500	2,650	3,380	1,790	1,580	1,370
8	6,200	15,770	9,150	7,270	2,650	3,120	13,980	3,120	3,120	2,880	1,580	1,370
9	8,010	12,270	11,720	8,390	2,650	3,650	7,640	2,650	3,930	5,510	1,580	1,580
10	5.180	9,150	14,570	9,150	2,650	3,650	5,850	2,430	6,200	7,640	1,580	1,680
11	3,930	7,270	12.830	8,390	2,430	3,930	4,530	2,000	5,180	5,510	1,580	1,580
12	3,120	10,330	11,200	7,640	2,210	3,930	4,220	2,000	5,850	4,530	1,580	1,160
13	2,650	12,830	9,540	8,010	2,210	6,200	4,530	1,790	4,850	3,650	1,580	1,160
14	4,220	11,200	8,010	12,830	2,210	5,180	4,220	1,580	3,650	3,380	1,580	1,370
15	4,530	9,540	7,270	68,900	2,000	5,510	4,220	1,580	3.120	2,880	1,580	1,580
16	3,930	13,980	6,200	102,100	2,000	5,180	3,650	3,650	2,880	2,880	1,580	1,370
17	4,220	38,500	5,850	80,100	2,000	4,850	3,120	2,880	2,880	2,650	1,790	1,370
18	3,930	20,640	5,850	31,700	2,000	3,930	6,200	2,000	3,930	3,650	2,000	2,000
19	4,220	13,400	5,180	21,300	2,000	3,380	18,170	2,000	4,850	4,220	2,000	2,430
20	3,930	9,930	4,530	15,770	2,000	3,380	9,930	1,790	3,380	3,650	2,210	2,430
21	5,850	7,640	4,530	12,270	2,000	3,380	6,910	1,790	3,120	3,120	2,430	2,880
22	5,850	7,640	5,180	9,150	2,000	3,930	5,180	2,000	2,880	2,880	2,210	2,880
23	5,510	7,640	9,150	7,640	2,000	3,930	4.220	2,000	2,650	2,650	2,000	2,880
24	5,510	6,200	64,200	6,910	2,000	5,510	3,930	1,580	2,430	2,430	2,000	2,880
25	5,510	7,270	58,600	5,850	2,000	9,930	3,380	1,790	2,210	2,210	2,000	2,880
26	4,850	6,550	24,800	5,510	1,790	8,390	2,880	1,790	2,000	2,210	1,790	2,880
27	4,220	6,200	15,770	5,510	2,000	6,200	2,650	2,000	2,000	2,000	1,790	2,880
28	4,220	27,700	11,200	3,930	2,000	4,530	2,650	2,000	2,000	2,000	1,790	2,880
29	7,270	....	8,390	3,380	2,000	4,850	2,430	2,430	1,790	2,000	1,580	2,880
30	21,300	....	8,010	3,380	2,000	5,850	2,000	21,300	1,790	2,000	1,580	2,880
31	38,500	....	10,740	....	2,000	....	2,000	13,400	....	2,000	....	3,650
1904.												
1	3,650	3,120	18,170	13,400	13,400	5,850	2,430	1,580	950	750	750	230
2	3,650	6,200	56,400	72,600	10,330	8,390	2,430	1,580	950	750	750	570
3	4,530	6,200	16,370	31,700	8,770	9,930	2,430	2,430	950	750	750	750
4	4,850	6,200	73,850	19,380	7,270	7,640	2,430	2,210	950	750	750	1,370
5	4,850	21,300	27,700	13,400	6,200	9,540	2,430	2,210	950	750	750	750
6	4,850	24,800	9,930	8,770	5,510	9,540	2,430	2,000	950	750	570	1,160
7	4,850	51,100	8,010	8,770	5,180	7,640	4,220	2,880	750	750	570	1,370
8	4,530	24,800	80,100	7,270	4,850	5,180	6,550	2,000	750	750	570	1,370
9	4,530	12,270	36,800	7,270	4,539	4,850	9,150	1,580	950	750	570	1,370
10	4,530	6,200	16,370	11,200	4,220	4,530	16,370	1,580	950	750	570	1,160
11	4,220	4,850	9,930	11,200	3,930	6,550	26,200	1,370	950	750	750	1,160
12	3,650	3,650	9,930	9,930	3,650	4,850	15,770	1,370	950	750	750	1,160
13	3,380	3,120	6,910	8,770	3,650	4,220	8,010	1,160	950	750	750	1,160
14	3,380	2,880	6,910	7,270	3,650	3,650	7,270	1,160	750	750	750	1,160
15	3,380	3,380	6,200	6,200	3,650	3,120	5,180	1,160	750	750	750	1,160
16	3,380	3,650	5,510	5,510	3,650	3,120	5,180	1,160	950	750	750	1,160
17	3,120	4,220	4,530	5,510	3,650	4,200	3,380	950	950	750	750	1,160
18	3,120	6,200	4,530	5,180	3,930	2,880	2,880	1,370	950	750	750	1,160
19	3,120	4,850	5,510	4,220	4,530	2,880	2,650	1,160	950	750	750	1,160
20	3,120	5,180	4,530	4.220	13,400	2,880	2,880	1,370	750	750	570	1,160
21	3,120	5,180	9,150	3,930	9.540	2,430	2,430	1,370	750	1,580	570	1,160
22	3,120	6,200	8,010	3,650	8,010	8,770	2,210	1,370	750	1,580	570	1,160
23	7,640	6,200	9,150	3,650	5,850	8,010	2,000	1,370	750	1,370	570	1,160
24	46,000	7,640	21,300	3,120	4,850	7,270	2,650	1,370	750	1,160	430	1,370
25	15,170	16,370	18,170	3,120	4,530	4,220	2,650	1,160	750	1,160	430	1,370
26	8,010	17,570	14,570	3,120	4,850	3,120	2,430	1,160	750	950	430	1,370
27	4,500	9,540	10,740	3,650	5,180	2,000	2,430	950	750	750	430	2,000
28	3,380	5,510	10,740	4,850	4,530	2,650	2,000	950	750	750	320	2,430
29	2,650	4,530	8,390	12,270	4,220	2,430	1,790	1,160	750	750	320	2,650
30	2,430	....	6,910	18,170	3,650	2,430	1,580	1,160	750	750	230	2,650
31	2,650	....	6,200	....	4,850	....	1,580	950	....	750	....	2,650

Estimated monthly discharge of Juniata River at Newport, Pa., 1899–1904.

[Drainage area, 3,476 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1899.					
March (21–31)	39,400	6,550	14,429	4.151	1.698
April	20,000	1,790	6,042	1.738	1.939
May	21,300	1,160	4,301	1.237	1.426
June	2,210	230	760	.219	.244
July	1,580	230	904	.260	.300
August	6,200	750	1,525	.439	.506
September	5,510	1,160	1,787	.514	.573
October	1,370	430	774	.223	.257
November	5,850	430	2,095	.603	.673
December	9,150	1,160	3,628	1.044	1.204
The period	39,400	230	3,624	1.043	8.820
1900.					
January	42,200	2,000	7,263	2.089	2.408
February	53,200	1,790	10,188	2.931	3.052
March	66,500	3,380	9,523	2.740	3.159
April	5,180	3,120	4,264	1.227	1.369
May	3,380	1,370	2,226	.640	.738
June	2,430	1,370	1,692	.487	.543
July	1,580	750	1,074	.309	.356
August	2,430	570	971	.279	.322
September	1,580	570	695	.200	.223
October	2,430	570	1,016	.292	.337
November	52,200	750	4,137	1.190	1.328
December	15,170	1,370	3,596	1.035	1.193
The year	66,500	570	3,887	1.118	15.028

Estimated monthy discharge of Juniata River at Newport, Pa., 1899-1904—Con.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1901.					
January	3,380	1,160	2,161	0.622	0.717
February	3,930	1,580	2,571	.740	.771
March	106,500	2,000	15,260	4.390	5.061
April	77,600	5,850	20,104	5.784	6.453
May	71,300	3,120	16,683	4.799	5.533
June	27,000	3,120	6,869	1.976	2.205
July	6,910	1,580	2,794	.804	.927
August	10,740	1,160	3,808	1.096	1.264
September	7,640	1,370	3,069	.883	.985
October	2,210	950	1,411	.406	.468
November	5,850	950	1,580	.455	.508
December	140,100	2,000	19,940	5.737	6.614
The year	140,100	950	8,021	2.308	31.506
1902.					
January	32,500	2,000	7,259	2.088	2.407
February	92,100	2,210	10,316	2.968	3.091
March	292,500	3,650	41,044	11.808	13.614
April	148,800	2,650	21,813	6.275	7.001
May	3,120	1,370	2,135	.614	.708
June	5,180	1,160	1,870	.538	.600
July	13,400	2,000	4,586	1.319	1.521
August	5,180	750	2,331	.671	.774
September	3,650	570	1,043	.300	.335
October	11,720	1,370	3,586	1.032	1.190
November	3,120	1,370	1,823	.524	.585
December	44,100	2,210	10,711	3.081	3.552
The year	292,500	570	9,043	2.602	35.378

Estimated monthly discharge of Juniata River at Newport, Pa., 1899–1904—Cont'd.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1903.					
January	38,500	2,650	7,988	2.298	2.649
February	86,700	6,200	18,304	5.266	5.484
March	100,600	4,530	18,444	5.306	6.117
April	102,100	3,380	16,857	4.850	5.411
May	3,380	1,790	2,330	.670	.772
June	9,930	1,580	4,150	1.194	1.332
July	32,500	2,000	7,322	2.106	2.428
August	21,300	1,580	3,090	.889	1.025
September	10,330	1,790	3,915	1.126	1.256
October	7,640	1,580	2,917	.839	.967
November	2,430	1,580	1,776	.511	.570
December	3,650	1,160	2,050	.590	.680
The year	102,100	1,160	7,429	2.137	28.691
1904.					
January [a]	46,000	2,430	5,722	1.65	1.90
February	51,100	2,880	9,756	2.81	3.03
March	80,100	4,530	17,150	4.93	5.68
April	72,600	3,120	10,710	3.08	3.44
May	13,400	3,650	5,742	1.65	1.90
June	9,930	2,000	5,160	1.48	1.65
July	26,200	1,580	4,968	1.43	1.65
August	2,880	950	1,460	.420	.484
September	950	750	850	.245	.273
October	1,580	750	856	.246	.284
November	750	230	607	.175	.195
December	2,650	230	1,344	.386	.445
The year	80,100	230	5,360	1.54	20.93

[a] Frozen January 1 to 23. Rating table assumed to apply correctly.

SUSQUEHANNA RIVER AT HARRISBURG, PA.

In 1890 regular daily observations of fluctuations of the water surface of the Susquehanna River at Harrisburg were started by E. Mather, president of the Harrisburg water board. These observa-

tions have been continued since that time and have been furnished through the courtesy of Mr. Mather.

The gage, the zero of which is the low-water mark of 1803, is located at the pump house of the waterworks in the pump well, which is connected with the river by two large mains. The original readings are taken in feet and inches, and for convenience in computations have been reduced to feet and tenths.

The first discharge measurement was made at this station in March, 1897, by Mr. E. G. Paul, who has carried on systematic measurements there since that date. The measuring section is at the lower side of the Walnut street toll bridge. The initial point for soundings is the upright at the end of the hand rail on the downstream side on the left bank.

At this point the river is divided into two channels by Fosters Island, which at the measuring section is about 1,200 feet wide. Its banks are low and sloping and during extreme floods the island is submerged.

At ordinary stages the left channel is 1,350 feet wide and is broken by six bridge piers. The right channel is 1,300 feet wide and is broken by seven piers. The main banks of the river are high. The bed is composed of a hard material and is permanent, except in the spans adjacent to the island. The velocity never becomes too sluggish to measure.

During the spring and summer of 1903 a new bridge was built across Susquehanna River at Market street, which is about 1,200 feet below the gaging section. The piers of this new bridge obstruct the channel of the river by between 10 and 15 per cent of the total cross section. The result of this obstruction, as shown by the discharge measurements taken since the erection of the piers, has been to back up the water, thus increasing the gage height at the Walnut street station. On account of this backwater the measurements taken during 1903 show that, in order to use the standard rating table after June 1, 1903, and until January 1, 1904, a deduction of 14 per cent is necessary in the daily discharges. The following table gives the data from which this deduction was made:

Date.	Gage height.	Observed discharge.	Standard rating table discharge.	Difference.	Difference.
	Feet.	*Second-feet.*	*Second-feet.*	*Second-feet.*	*Per cent.*
May 8	2.30	16,280	15,980	300	−2
June 2	1.50	8,390	9,520	1,130	12
October 5	1.65	9,116	10,560	1,440	13
November 2	3.08	20,245	24,350	4,100	16

About January 1, 1904, the old piers which were standing at the site of the new bridge at Market street were removed, so that the river channel was left in such a condition that the stage of the river at Walnut street bridge returned to the same condition that existed before the 1903 bridge was built.

In the summer of 1904 certain changes and improvements were made at the pumping station, and a partial dam was made in the river just below the pumping station. The effect of this dam was to raise the apparent stage of the water at the gage. A correction was applied to measurements of discharge made prior to July 18, 1904, so as to eliminate the effect of the dam and alterations at the pump house upon the gage readings.

On July 18, 1904, a standard chain gage was attached to the guard rail on the upstream side of the Walnut Street Bridge in the left-hand span. The datum of this gage is the low-water mark of 1803, and it is believed that it records truly the stage of the river to that datum, and that the changes in bridges below and at the pumping station above do not affect the records obtained from it.

The length of chain is 39.38 feet; the bench mark is on the left abutment at the top upstream outer corner of the bridge seat; its elevation is 32.99 feet above low water of 1803.

Observations at the gage in the pumping station are made by the engineer, C. M. Nagle, each morning before starting the pump. Observations at the standard chain gage are made by Thomas Numbers, toll collector, once daily.

The following pages give the data which have been collected at Harrisburg gaging station since its establishment; also the results of the computation of these data.

Discharge measurements of Susquehanna River at Harrisburg, Pa., 1897–1904.

Date.	Hydrographer.	Gage height.	Area of section.	Mean velocity.	Discharge.
1897.		*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
Mar. 31	E. G. Paul	5.42	17,048	3.45	58,859
May 15	do	7.83	24,351	4.35	105,888
Aug. 30	do	1.50	7,444	1.29	9,568
Sept. 16	do	.58	3,756	1.06	3,962
Nov. 17	do	2.50	9,325	1.91	17,824

Discharge measurements of Susquehanna River at Harrisburg, Pa., 1897–1904—Continued.

Date.	Hydrographer.	Gage height.	Area of section.	Mean velocity.	Discharge.
1898.		*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
Feb. 25	E. G. Paul	6.58	19,420	3.91	76,250
Mar. 24	do	15.75	43,715	5.73	250,485
Mar. 25	do	10.75	29,587	5.06	149,589
Mar. 26	do	14.65	39,725	5.62	223,374
July 10	do	.83	4,400	1.22	5,466
Sept. 22	do	.92	4,834	1.44	6,993
Oct. 7	do	.72	4,459	1.31	6,121
1899.					
June 11	E. G. Paul	1.75	7,656	1.53	11,746
July 29	do	.91	4,524	1.44	6,534
Sept. 12	do	.75	4,845	1.12	5,404
Oct. 25	do	.16	3,699	.98	3,625
1900.					
May 16	E. G. Paul	2.42	9,404	1.87	17,621
Sept. 21	do	.08	3,313	.80	2,655
Sept. 28	do	.04	3,223	.72	2,357
1901.					
Aug. 12	E. G. Paul	2.70	9,775	2.05	20,023
Oct. 23	do	1.85	7,737	1.62	12,556
1902.					
Apr. 17	E. G. Paul	5.40	17,476	3.46	60,534
Sept. 15	do	1.10	5,023	1.39	6,982
1903.					
May 8	E. C. Murphy	2.30	9,810	1.65	16,280
June 2	Hoyt and Holmes	1.50	7,577	1.11	8,390
Oct. 5	Paul and Sawyer	1.65	7,290	1.25	9,116
Nov. 2	E. G. Paul and others	3.08	10,325	1.96	20,245
1904.					
Mar. 9	Sawyer and Tillinghast	15.60			[a]261,860
July 15	N. C. Grover	3.08	11,870	2.22	26,408
Sept. 13	J. C. Hoyt	1.10	6,646	.90	5,950
Sept. 29	do	1.78	8,730	1.34	11,660
Oct. 1	N. C. Grover	1.85	8,460	1.48	12,560
Nov. 4	Hoyt and Comstock	1.82	8,972	1.39	12,600

[a] River running full of ice. Measurement approximate.

Mean daily gage height, in feet, of Susquehanna River at Harrisburg, Pa., 1891–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1891.												
1	2.83	10.58	11.00	8.25	3.58	2.00	2.75	3.25	4.67	1.75	2.50	4.25
2	3.00	11.50	9.00	9.00	3.50	1.92	2.50	3.17	4.00	1.67	2.50	4.00
3	3.33	11.50	7.33	8.58	3.42	2.00	2.58	3.08	3.67	1.67	2.33	3.67
4	4.50	11.17	6.67	8.75	3.42	2.00	3.17	2.92	3.33	1.58	2.25	3.50
5	5.25	10.17	5.67	8.42	3.25	2.00	4.08	3.00	3.00	1.58	2.25	4.58
6	5.00	8.92	5.67	8.00	3.08	2.00	3.50	3.08	3.00	1.58	2.25	8.75
7	5.50	7.67	5.25	7.17	3.00	2.08	3.08	3.00	3.83	1.58	2.17	9.50
8	5.42	7.50	5.00	6.42	3.00	2.17	2.67	3.33	4.67	1.75	2.17	8.33
9	4.92	7.50	4.67	6.00	2.92	2.58	2.75	3.08	4.50	2.58	2.00	7.00
10	4.50	7.42	4.67	5.67	2.75	2.75	2.67	2.83	4.08	3.00	2.00	6.00
11	4.08	7.50	6.16	5.33	2.67	3.00	2.92	2.75	3.83	2.83	2.00	5.42
12	4.25	7.42	7.08	6.08	2.67	2.75	2.83	2.58	3.50	2.67	2.67	5.00
13	6.00	7.00	8.50	7.33	2.58	2.67	2.75	2.58	3.08	2.67	3.67	4.17
14	8.75	6.42	9.67	9.00	2.50	2.67	2.50	2.58	3.00	2.58	4.00	4.33
15	7.92	5.92	10.75	8.50	2.50	2.58	2.25	2.50	3.00	2.42	4.25	4.00
16	7.50	5.58	10.00	8.00	2.42	2.50	2.17	2.50	2.67	2.33	4.08	3.83
17	6.67	5.92	8.83	7.67	2.42	2.42	2.00	2.50	2.67	2.08	3.75	3.75
18	6.00	14.25	7.75	7.42	2.33	2.33	1.83	2.42	2.58	2.00	4.00	3.67
19	5.67	19.00	6.83	6.83	2.25	2.33	1.92	2.25	2.58	1.83	4.83	4.58
20	5.08	17.83	6.17	6.75	2.25	2.33	2.08	2.42	2.50	1.92	4.75	5.00
21	4.83	13.25	5.92	6.33	2.04	3.33	2.08	2.25	2.25	2.17	4.67	4.75
22	4.50	11.75	6.33	5.92	2.00	3.58	2.08	2.08	2.17	2.50	4.25	4.17
23	7.08	11.50	6.67	5.50	2.13	5.42	2.00	2.00	2.08	3.25	4.17	3.83
24	9.17	10.25	8.08	5.17	2.25	6.17	2.00	3.08	2.08	4.67	4.08	3.92
25	9.50	9.00	10.33	5.00	2.33	5.58	4.33	6.50	2.00	4.17	5.42	4.58
26	9.42	8.25	10.83	4.75	2.29	4.58	4.00	6.58	1.92	3.67	6.42	6.33
27	8.42	11.33	10.08	4.67	2.25	4.33	3.83	5.25	1.83	3.17	6.17	8.25
28	7.50	13.08	8.92	4.25	2.21	3.75	3.33	5.67	1.75	3.00	5.42	9.33
29	7.00	....	7.83	4.08	2.17	3.50	3.00	6.00	1.75	2.83	5.00	8.58
30	7.08	....	7.50	3.83	2.08	3.50	2.75	5.33	1.75	2.67	4.67	7.83
31	9.83	....	7.67	....	2.00	....	3.92	5.17	....	2.58	....	8.50
1892.												
1	8.50	2.83	4.50	9.75	3.00	5.92	4.67	1.92	2.92	1.08	.50	1.92
2	8.25	2.92	4.00	9.00	2.83	5.50	4.33	2.00	2.50	1.25	.50	1.83
3	8.75	2.92	3.58	8.50	2.83	5.17	3.75	1.83	2.33	1.42	.50	1.75
4	9.33	3.08	3.25	11.75	2.83	7.58	3.67	2.00	2.17	1.25	.50	1.58
5	8.83	3.08	3.00	14.33	4.50	12.50	3.50	3.00	2.00	1.08	.50	1.58
6	8.00	3.00	2.67	14.67	5.83	12.00	3.58	2.83	1.83	1.08	.50	1.50
7	7.83	3.00	2.83	13.17	7.58	11.25	3.42	2.83	1.83	1.00	.50	1.50
8	6.83	2.92	2.83	11.33	7.58	9.00	3.42	3.00	1.75	1.00	.50	1.50
9	5.33	2.75	3.83	9.50	7.83	7.67	3.42	2.67	1.67	1.00	.75	1.58
10	5.67	2.50	5.25	7.83	6.67	7.00	3.00	2.42	1.50	1.00	.92	1.67
11	4.17	2.58	6.17	7.00	5.58	7.42	2.83	2.17	1.50	1.00	1.00	2.42
12	3.67	2.50	5.92	6.42	5.00	7.00	2.50	2.08	1.42	.92	1.17	4.25
13	3.75	2.00	5.67	5.67	4.75	6.42	2.17	2.42	1.42	.92	1.17	4.00
14	5.50	1.80	5.00	5.33	4.25	5.42	2.17	2.50	1.50	.83	1.17	3.50
15	11.83	1.75	4.42	4.75	4.17	4.67	2.33	3.50	2.33	.83	1.25	3.08
16	13.17	1.83	4.00	4.75	4.17	4.17	2.42	4.17	2.33	.83	1.25	2.83
17	10.83	1.67	3.50	4.33	4.42	3.75	2.42	4.00	2.08	.83	1.25	2.92
18	9.08	1.75	3.33	4.33	4.83	3.58	2.25	3.50	1.83	.83	1.25	2.67
19	7.75	2.00	3.08	4.00	4.92	3.50	2.25	2.83	1.67	.83	1.92	2.58
20	7.67	2.33	3.00	3.83	5.67	3.50	2.08	2.67	1.50	.83	2.50	2.50
21	7.00	2.17	2.92	3.67	7.25	3.67	2.00	2.33	1.50	.83	2.50	2.42
22	6.17	2.50	2.67	3.50	8.25	4.00	1.75	2.17	1.50	.83	2.92	2.08
23	5.33	2.67	2.50	3.42	8.83	3.67	1.67	1.90	1.33	.83	3.58	1.50
24	4.75	3.17	2.50	3.50	8.75	3.50	1.67	1.83	1.17	.83	3.33	.92
25	4.50	3.50	2.67	3.50	8.25	3.67	1.67	1.92	1.17	.75	2.92	1.08
26	4.33	4.33	3.50	3.58	7.33	4.17	1.58	2.17	1.25	.58	2.50	2.58
27	3.58	4.50	4.50	3.58	6.67	3.58	1.50	2.00	1.25	.58	2.08	2.00
28	2.50	4.83	10.83	3.50	6.50	3.25	1.50	2.00	1.25	.58	2.00	2.25
29	2.08	4.67	13.00	3.33	6.33	3.50	1.50	2.00	1.08	.58	2.00	2.25
20	2.83	....	12.00	3.17	7.08	4.83	1.42	2.25	1.08	.58	1.92	2.25
31	2.83	....	10.58	....	6.42	....	1.67	3.00	....	.50	....	2.17

Mean daily gage height, in feet, of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1893.												
1	2.00	2.67	2.58	6.08	4.92	3.67	2.33	.92	3.58	2.00	2.17	4.00
2	2.50	3.00	2.58	6.00	4.83	3.67	2.17	.83	4.17	2.00	2.17	3.83
3	2.83	4.00	2.75	6.42	5.50	3.50	2.08	.83	3.92	1.83	2.17	3.67
4	2.83	4.17	2.75	7.50	6.83	3.58	1.92	.83	3.50	1.67	2.17	3.67
5	2.75	5.00	2.75	7.92	16.17	3.58	1.92	.75	2.67	1.50	2.33	3.67
6	2.67	5.08	2.50	8.92	16.50	3.17	1.67	.75	2.25	1.50	3.00	3.50
7	2.50	5.00	2.50	9.50	14.58	3.00	1.67	.67	2.00	1.42	3.25	3.17
8	2.50	5.33	2.67	8.83	12.00	3.00	1.58	.67	1.75	1.42	2.83	3.00
9	2.50	5.42	3.08	8.00	9.92	3.00	1.50	.58	1.67	1.42	2.75	3.00
10	2.50	6.42	6.50	8.42	8.25	2.83	1.50	.58	1.50	1.33	2.50	2.92
11	2.25	7.75	12.50	10.00	7.00	2.67	1.50	.50	1.50	1.33	2.50	2.83
12	2.25	11.58	13.83	9.42	6.17	2.58	1.50	.50	1.67	1.33	2.42	2.83
13	2.08	7.50	14.50	8.42	5.50	2.50	1.50	.42	2.00	1.25	2.33	2.83
14	2.08	6.50	14.58	7.75	5.00	2.33	1.50	.42	2.00	1.67	2.17	2.50
15	2.08	5.58	13.00	7.42	4.75	2.08	1.75	.42	1.83	4.67	2.08	2.00
16	2.00	5.25	12.25	8.08	4.58	2.00	1.83	.33	2.00	5.33	2.00	2.25
17	2.00	7.75	10.50	8.83	5.92	1.92	1.83	.33	2.50	5.25	1.92	2.42
18	2.00	6.75	8.83	8.92	8.50	1.83	1.67	.33	2.67	4.25	1.83	5.75
19	2.00	5.83	7.33	7.75	9.75	1.75	1.67	.33	4.42	3.83	1.75	8.83
20	2.00	5.33	6.67	6.92	9.00	1.75	1.67	.67	3.67	3.42	1.75	7.08
21	2.00	4.67	5.92	7.00	7.58	1.75	1.67	.58	3.25	3.00	1.67	6.00
22	2.00	4.25	5.58	10.00	7.00	1.58	1.50	.50	2.83	2.50	1.58	5.92
23	2.00	3.50	5.67	10.92	6.25	1.58	1.42	.42	2.50	2.50	1.58	4.42
24	2.00	3.00	6.83	10.50	5.58	1.75	1.33	.42	2.33	2.33	1.67	3.92
25	2.00	3.00	7.25	8.92	5.42	1.75	1.25	.33	2.33	2.25	1.67	3.83
26	2.00	3.00	7.75	7.67	4.92	2.00	1.17	.42	2.17	2.25	1.58	3.83
27	2.00	2.92	9.42	6.83	4.50	2.25	1.08	.50	2.00	2.25	1.58	4.83
28	2.00	2.75	8.67	6.17	4.33	2.50	1.08	.50	2.00	2.00	1.75	5.92
29	2.00	-------	7.83	5.67	4.17	2.75	1.83	1.00	2.00	2.00	2.83	5.83
30	2.33	-------	7.83	5.17	3.92	2.50	.92	3.00	2.00	2.00	3.67	5.17
31	2.50	-------	6.50	-------	3.67	-------	.92	3.08	-------	2.17	-------	4.67
1894.												
1	4.50	2.41	3.16	3.83	4.58	9.50	2.58	1.08	.33	1.91	5.08	2.41
2	4.50	2.33	3.33	3.66	4.50	9.66	2.41	1.08	.33	1.83	5.25	2.33
3	4.00	2.25	3.50	3.50	4.16	9.16	2.33	1.33	.33	1.58	5.41	2.50
4	3.66	2.16	3.75	3.25	3.83	8.58	2.25	1.50	.33	1.58	7.50	2.91
5	3.50	2.08	4.08	3.16	3.50	8.41	2.00	1.66	.25	1.41	7.66	3.50
6	3.33	2.00	5.66	3.00	3.16	7.91	2.00	1.58	.25	1.41	7.58	3.58
7	3.41	2.00	7.66	2.91	3.25	6.75	1.83	1.50	.33	1.33	7.16	3.58
8	5.16	2.00	11.33	2.83	3.33	6.00	1.83	1.50	.33	1.33	7.00	3.33
9	5.25	2.08	12.16	2.75	3.50	5.50	1.75	1.08	.41	1.25	6.50	3.00
10	4.58	3.50	10.83	2.75	3.50	5.00	1.66	1.08	1.00	1.33	6.00	3.00
11	3.75	5.00	8.50	2.83	3.50	4.66	1.58	1.08	1.91	2.08	5.50	3.33
12	3.33	6.00	9.83	3.00	3.08	4.00	1.50	1.00	1.50	4.91	5.33	4.00
13	2.50	5.66	7.16	3.25	2.91	3.75	1.41	1.00	1.33	5.58	4.66	4.33
14	3.16	4.58	7.00	3.66	2.75	3.66	1.41	1.00	1.25	5.08	4.50	5.75
15	3.16	4.33	6.41	6.33	2.50	3.66	1.33	1.00	1.25	4.66	4.00	6.16
16	2.83	3.66	5.83	7.58	2.50	3.58	1.33	1.00	1.16	4.16	3.91	6.33
17	2.66	3.33	5.50	9.08	2.33	3.41	1.25	1.00	1.08	3.83	3.66	5.75
18	2.83	3.33	5.08	9.08	2.33	3.16	1.16	1.00	1.08	3.66	3.50	5.16
19	2.83	3.33	4.83	8.50	2.33	3.00	1.08	.91	2.16	3.41	3.25	4.66
20	3.00	4.16	4.58	7.50	5.33	3.50	1.08	.91	4.08	3.00	3.16	4.33
21	2.83	5.66	4.50	6.75	16.33	3.41	1.08	.83	5.00	2.75	3.08	4.08
22	2.83	5.33	4.33	8.50	25.58	3.08	1.08	.83	5.50	2.50	3.25	3.83
23	2.58	5.16	4.50	9.41	21.41	2.83	1.00	.75	5.66	2.33	3.16	3.58
24	2.41	4.33	4.66	9.58	15.25	2.50	1.08	.75	4.83	2.16	3.00	3.50
25	2.41	3.33	5.50	9.91	11.83	2.50	1.25	.75	4.00	2.33	3.00	3.33
26	2.41	2.91	7.00	9.00	11.33	2.66	1.41	.75	3.41	3.58	2.83	3.08
27	2.41	2.33	6.33	7.25	11.66	2.58	1.50	.66	3.00	4.75	2.66	3.00
28	2.50	2.50	5.50	6.00	9.50	2.66	1.50	.66	2.58	4.83	2.58	3.00
29	2.58	-------	4.91	5.41	7.91	2.41	1.41	.58	2.25	4.33	2.58	4.00
30	2.58	-------	4.33	5.00	7.00	2.75	1.16	.50	2.08	4.00	2.50	3.66
31	2.50	-------	4.00	-------	7.50	-------	1.08	.41	-------	3.75	-------	3.66

Mean daily gage height, in feet, of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1895.												
1	3.92	2.92	6.00	5.75	3.42	2.67	2.83	.58	.75	.42	.21	3.08
2	4.00	2.83	8.58	5.67	3.33	2.58	2.67	.67	.75	.42	.21	3.08
3	4.25	3.00	8.08	6.17	3.25	2.50	2.92	.67	.67	.33	.25	2.75
4	4.33	3.00	10.50	6.83	3.00	2.25	2.50	.67	.67	.33	.25	2.50
5	4.33	7.00	7.83	6.67	2.75	2.08	2.25	.58	.58	.33	.33	2.25
6	4.33	5.67	7.67	6.17	2.67	1.92	2.00	.50	.58	.33	.38	2.00
7	4.33	5.75	6.67	6.00	2.50	1.83	1.92	.50	.75	.33	.38	1.92
8	4.50	5.67	6.25	5.75	2.42	1.75	1.75	.83	.75	.25	.42	1.92
9	4.75	5.50	5.83	8.08	2.25	1.75	1.58	.75	.67	.25	.42	1.92
10	6.17	5.50	6.17	12.00	2.75	1.58	1.50	1.00	.50	.21	.42	1.83
11	7.42	5.58	6.17	13.67	3.00	1.33	1.50	1.08	1.00	.21	.42	1.50
12	7.83	5.92	6.33	12.50	3.33	1.42	1.42	1.08	1.50	.21	.46	1.50
13	8.50	5.83	6.17	10.92	3.67	1.33	1.33	1.08	1.58	.33	.50	.96
14	7.83	5.83	6.00	9.50	4.33	1.25	1.33	.92	1.42	.29	.58	.75
15	6.75	5.67	6.50	10.00	4.33	1.25	1.25	1.33	1.00	.29	.58	1.00
16	6.25	5.58	6.75	9.75	4.17	1.25	1.25	1.33	.83	.25	.58	1.00
17	5.75	5.50	6.67	8.75	4.08	1.25	1.08	1.08	.67	.25	.67	1.33
18	5.42	5.50	6.33	7.58	3.67	1.25	1.00	1.00	.58	.42	.83	1.33
19	5.00	5.33	5.67	6.67	3.50	1.25	.92	1.00	.67	.58	1.00	1.33
20	4.50	5.25	5.50	6.00	3.33	1.25	.92	.92	.67	.50	1.00	1.33
21	4.42	5.17	5.33	5.50	3.17	1.17	.83	.83	.67	.42	.92	1.50
22	4.33	5.08	5.17	5.00	3.08	1.00	.83	.58	.58	.42	.79	1.83
23	4.00	5.00	5.00	4.58	2.92	.75	.83	.50	.58	.33	.67	2.00
24	4.00	4.92	5.00	4.33	2.75	.75	.83	.50	.58	.25	.75	2.67
25	3.33	4.75	5.00	4.00	2.58	.75	.83	.42	.58	.25	.75	2.75
26	3.25	4.58	5.83	3.75	2.50	1.50	.83	.33	.50	.21	.75	2.83
27	3.08	4.50	8.00	3.58	2.50	1.50	.83	.33	.50	.13	.75	3.33
28	3.08	4.75	9.00	3.75	2.42	1.50	.83	.33	.42	.08	2.67	3.50
29	3.08	-------	8.00	3.75	2.42	2.00	.75	.33	.42	.08	2.83	5.08
30	3.25	-------	7.17	3.50	3.08	3.50	.58	.33	.42	.04	2.83	5.67
31	3.00	-------	6.33	-------	3.00	-------	.42	.50	-------	.04	-------	5.67
1896.												
1	9.92	4.50	7.17	14.58	3.00	1.50	2.67	4.67	.33	5.42	2.08	3.92
2	9.17	3.75	9.17	14.58	3.00	1.50	2.42	4.33	.33	4.25	1.92	3.92
3	8.42	3.58	9.75	13.75	2.83	1.75	2.08	3.83	.33	4.00	1.83	3.83
4	6.50	3.58	8.42	12.33	2.83	1.83	1.83	3.75	.33	3.17	1.83	3.33
5	5.08	3.50	7.17	10.50	2.67	1.67	1.75	3.67	.25	2.67	1.83	3.00
6	4.00	4.00	5.50	8.83	2.50	1.67	1.67	3.58	.25	2.08	7.25	2.75
7	3.83	11.50	5.00	7.25	2.42	1.67	2.17	2.50	.25	1.83	10.08	2.67
8	3.00	12.50	4.75	6.50	2.17	1.58	2.00	2.33	.25	1.67	7.75	2.50
9	4.67	10.33	4.50	6.17	2.08	1.42	1.92	2.33	.25	1.50	6.50	2.50
10	4.33	8.50	4.83	5.83	2.00	1.75	2.33	2.25	.25	1.50	5.67	2.67
11	4.08	6.83	5.08	5.50	2.00	2.50	2.75	2.25	.25	1.50	4.75	3.42
12	4.00	5.33	4.67	5.50	1.92	2.58	2.75	2.00	.25	1.50	4.42	3.75
13	3.92	4.92	4.00	6.00	1.75	3.42	2.50	1.83	.25	1.92	4.17	4.00
14	4.00	4.25	3.50	6.42	1.67	3.25	2.17	1.67	.33	7.33	4.00	4.25
15	3.83	3.75	2.67	8.00	1.67	2.92	2.00	1.67	.33	7.00	3.83	3.83
16	3.83	3.75	2.67	8.42	1.75	2.58	1.83	1.58	.33	9.50	3.67	3.67
17	3.75	3.83	2.33	8.17	1.58	2.58	1.67	1.58	.50	7.67	3.50	3.42
18	3.58	3.58	2.50	7.33	1.50	2.83	1.58	1.58	.50	5.58	3.33	3.08
19	3.67	2.92	3.17	6.83	1.50	2.67	1.67	1.33	.58	4.83	3.17	2.92
20	4.00	3.00	4.00	6.33	1.50	3.00	1.67	1.25	.58	4.08	3.00	2.58
21	3.67	2.33	6.00	5.75	1.50	3.17	1.92	1.00	.67	3.58	2.83	2.33
22	3.50	3.67	5.75	5.25	1.42	3.00	1.67	.83	.83	3.42	2.67	2.00
23	3.50	5.42	5.75	4.83	1.42	2.42	1.58	.83	1.17	3.25	2.58	2.00
24	3.50	5.42	6.25	4.58	1.42	2.33	1.67	.83	1.17	3.00	2.50	1.50
25	4.00	3.42	5.58	4.33	1.33	2.25	1.67	.83	.92	3.00	2.50	1.50
26	7.25	3.50	5.00	4.08	1.25	2.67	1.75	.75	.75	3.00	2.33	1.50
27	7.33	3.67	5.25	4.00	1.17	4.75	1.92	.75	.58	2.75	2.33	1.50
28	6.17	3.17	6.08	3.58	1.25	4.00	2.50	.67	.50	2.67	2.42	1.50
29	6.00	3.17	6.50	3.42	1.50	3.50	2.50	.58	.42	2.50	2.67	1.33
30	5.75	-------	9.25	3.25	1.50	3.08	3.75	.50	.83	2.42	3.50	1.58
31	5.42	-------	12.50	-------	1.50	-------	4.33	.33	-------	2.25	-------	1.75

Mean daily gage height, in feet, of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1897.												
1	1.83	3.33	4.25	5.00	3.08	2.92	1.42	4.00	1.25	1.75	.67	5.00
2	2.00	3.17	3.67	4.67	3.08	2.83	1.33	4.33	1.08	1.50	1.17	4.50
3	2.00	3.17	3.25	4.33	5.50	2.67	1.25	3.83	1.00	1.33	3.08	4.00
4	2.08	3.17	3.83	4.17	6.50	2.58	1.25	3.25	1.00	1.17	4.08	3.75
5	2.50	3.08	4.92	4.00	7.50	2.67	1.25	2.83	1.00	1.08	3.50	3.33
6	3.00	3.00	5.92	3.83	7.08	3.00	1.25	2.67	.92	1.00	3.08	4.75
7	3.67	4.25	7.67	3.75	7.00	2.67	1.42	2.42	.83	1.00	3.00	5.17
8	3.67	7.50	8.58	3.75	6.33	2.50	1.42	2.67	.83	.92	2.75	5.08
9	3.67	6.58	8.00	3.75	5.50	2.67	1.25	2.50	.83	.83	2.50	5.42
10	3.33	5.42	6.92	5.92	4.83	2.67	1.25	2.08	.66	.67	2.41	4.92
11	3.08	4.83	6.50	9.00	4.50	2.67	1.17	2.08	.58	.67	2.67	4.33
12	2.83	4.50	7.25	9.50	4.00	2.67	1.08	2.00	.67	.58	2.67	4.17
13	2.42	3.92	8.67	8.00	4.00	3.08	1.00	1.83	.67	.75	2.50	4.17
14	2.00	3.83	8.42	6.83	6.00	3.50	1.08	1.75	.67	.75	2.50	4.33
15	2.00	3.83	7.75	6.00	7.75	3.25	1.00	1.58	.50	.75	2.50	4.58
16	2.00	3.50	7.00	6.00	7.92	2.92	1.00	1.58	.58	.75	2.50	6.58
17	2.00	3.50	6.92	6.58	7.33	2.67	1.17	1.50	.67	.67	2.50	7.67
18	2.17	3.33	5.50	7.00	6.50	2.50	1.17	1.50	.75	.67	2.67	8.17
19	2.33	3.58	5.00	6.58	5.75	2.25	1.08	1.42	.75	.58	2.92	7.33
20	2.00	4.08	5.33	6.00	5.00	2.17	1.08	1.42	.67	.58	3.42	6.33
21	1.83	4.00	7.42	5.50	4.25	2.17	1.50	1.33	.58	.50	3.25	5.58
22	1.83	4.25	8.25	4.92	4.25	2.17	1.50	1.17	.58	.58	3.17	5.00
23	1.92	5.92	9.75	4.50	3.58	2.00	1.33	1.17	.58	.75	2.83	4.08
24	1.67	7.92	9.50	4.17	3.50	1.83	1.42	1.25	1.00	.75	2.50	3.83
25	1.67	7.50	10.17	3.83	3.75	1.75	1.58	1.67	1.50	1.00	2.50	3.42
26	1.50	6.50	11.50	3.67	3.75	1.75	1.75	2.67	1.50	1.00	2.50	2.83
27	3.33	5.50	10.67	3.58	3.50	1.67	1.75	2.08	1.83	1.00	2.33	2.75
28	3.33	4.50	8.00	3.50	3.58	1.58	2.17	1.75	1.92	.92	2.50	2.67
29	3.00	....	7.42	3.33	3.92	1.58	3.83	1.58	2.25	.83	3.50	2.67
30	3.25	....	6.33	3.17	3.50	1.50	4.50	1.50	2.00	.75	4.92	2.58
31	3.33	....	5.58	....	3.25	....	4.08	1.33	....	.75	....	2.50
1898.												
1	2.66	3.91	4.66	8.66	6.00	4.33	2.00	1.41	2.66	.75	4.66	3.08
2	2.33	3.41	4.33	7.41	5.41	4.16	2.16	1.50	2.33	.75	4.00	3.16
3	2.16	3.00	4.16	6.41	4.83	3.91	2.00	1.41	3.00	.66	3.66	3.08
4	2.66	2.66	3.91	5.75	4.66	3.58	1.75	2.33	2.50	.66	3.50	3.00
5	1.91	2.66	3.66	5.41	4.41	3.33	1.66	4.58	2.08	.66	3.16	3.66
6	1.91	2.66	3.58	4.91	4.43	3.00	1.58	5.33	1.91	.66	3.00	5.00
7	2.25	2.66	3.50	4.50	4.66	2.83	1.50	4.00	1.66	.66	2.91	4.50
8	2.50	3.08	3.50	4.41	5.50	2.66	1.41	3.50	1.66	1.00	2.50	4.08
9	2.66	3.41	3.33	4.16	6.25	2.50	1.33	3.08	1.66	1.33	2.50	3.83
10	2.75	3.50	3.33	3.83	5.58	2.50	1.25	3.66	2.00	1.41	2.50	3.58
11	3.00	3.41	3.83	3.66	5.16	2.33	1.16	4.25	2.83	2.25	2.58	3.08
12	3.00	3.75	4.91	3.50	4.75	2.33	1.08	3.75	2.75	2.40	4.00	2.50
13	3.33	4.41	6.50	3.33	4.50	2.25	1.00	3.33	2.58	2.33	8.75	2.25
14	4.00	7.66	8.66	3.25	4.00	2.25	.91	2.66	2.08	2.00	8.00	2.25
15	6.95	8.16	9.83	3.16	4.00	2.41	.83	2.50	1.91	2.00	6.58	2.08
16	8.08	7.50	9.33	3.66	4.25	2.75	.83	2.25	1.75	2.08	5.50	2.00
17	7.83	6.50	8.08	4.08	5.16	3.25	.75	2.00	1.41	2.16	4.83	2.00
18	7.58	5.83	7.16	3.91	6.08	3.00	.66	1.91	1.33	3.25	4.33	1.91
19	6.58	5.00	6.33	3.66	5.33	2.66	.66	2.33	1.16	3.75	4.16	2.00
20	5.83	4.33	5.83	3.50	5.50	2.41	.75	3.00	1.00	4.00	4.16	2.50
21	5.75	4.66	7.33	3.41	6.66	2.33	.91	4.41	.91	4.33	4.25	2.91
22	6.16	6.83	9.25	3.33	6.66	2.33	.75	4.33	.91	4.25	4.58	3.08
23	7.41	6.91	10.91	3.16	6.50	2.08	.91	3.75	.91	7.33	4.83	3.50
24	9.25	7.75	15.63	3.00	6.00	2.00	.83	3.41	.83	8.33	4.66	5.41
25	10.50	6.66	15.25	3.50	7.00	2.16	.83	3.00	.83	7.41	4.33	7.83
26	9.50	6.25	11.66	6.66	6.50	2.08	.83	2.66	.75	6.16	4.00	7.66
27	8.00	5.66	9.25	10.33	6.50	2.00	1.33	2.50	.91	5.66	3.91	6.33
28	7.00	5.00	7.75	9.50	6.16	1.91	1.16	2.41	.91	5.58	3.66	5.33
29	6.08	....	6.66	8.16	5.75	1.83	1.83	4.16	.75	5.66	3.50	4.83
30	5.50	....	7.00	6.66	5.33	1.66	1.58	3.83	.75	6.08	3.33	4.33
31	4.83	....	9.00	....	4.91	....	1.33	3.00	....	5.33	....	3.83

Mean daily gage height, in feet, of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	3.25	2.50	8.41	7.25	3.41	2.50	1.75	.75	1.83	1.08	.50	1.75
2	3.16	2.00	8.16	6.41	3.08	2.58	1.66	.75	1.50	.83	1.66	1.58
3	2.75	1.91	7.83	5.83	3.08	2.50	1.66	.75	1.25	.83	2.50	1.50
4	3.25	2.25	7.41	5.33	3.41	2.50	1.50	.75	1.08	.75	3.25	1.50
5	3.50	2.58	8.00	4.91	3.16	2.50	1.33	.75	1.08	.66	4.50	1.50
6	5.00	2.66	12.50	4.41	3.16	2.3[illegible]	[illegible].25	.91	1.00	.66	3.91	1.50
7	8.00	2.83	13.00	4.25	3.00	2.0[illegible]	[illegible]	.75	.91	.58	3.75	1.50
8	6.83	2.41	11.41	4.75	2.75	1.91	1.16	.75	.91	.58	3.16	1.50
9	6.08	2.50	9.25	6.83	2.83	1.91	1.16	.83	.83	.58	2.83	1.50
10	5.41	2.41	7.66	8.75	2.66	1.91	1.16	.75	1.00	.66	2.50	1.50
11	4.58	2.41	6.50	8.41	2.75	1.75	1.41	.66	1.00	.58	2.25	1.50
12	4.00	4.41	5.75	7.75	2.75	1.66	1.25	.66	.75	.58	2.16	1.50
13	3.33	4.41	5.75	6.75	2.91	1.66	1.16	1.08	.83	.50	2.08	2.75
14	3.16	4.58	7.50	6.75	2.83	1.58	1.16	1.08	1.41	.50	2.00	5.50
15	3.33	4.58	8.41	8.00	2.58	1.50	1.16	1.25	1.25	.51	2.25	6.33
16	3.66	4.66	8.00	8.00	2.50	1.50	1.08	.91	.83	.41	2.41	6.00
17	4.83	4.83	7.41	7.83	2.50	1.41	1.00	.66	.75	.41	2.41	5.33
18	7.00	4.83	6.41	7.33	2.58	1.25	1.25	.66	.75	.41	2.41	4.58
19	6.33	4.91	4.33	6.83	3.75	1.25	1.25	.50	.58	.41	2.83	4.08
20	5.66	4.75	7.16	6.00	4.75	1.25	1.25	.50	.66	.33	3.00	3.75
21	4.91	4.91	8.50	5.41	5.16	1.25	1.25	.50	.75	.33	2.91	3.75
22	4.33	5.33	8.16	5.08	4.25	1.16	1.33	.50	.66	.33	2.58	3.83
23	4.25	7.50	7.50	4.91	3.91	1.08	1.33	.50	.66	.33	2.50	4.50
24	4.08	7.50	7.16	4.50	3.58	1.00	1.33	.50	.66	.16	2.25	4.25
25	4.16	7.16	7.41	4.41	3.16	1.41	1.16	.50	.66	.16	2.25	5.83
26	5.25	6.83	7.41	4.00	3.00	2.00	1.00	.41	.66	.25	2.25	6.75
27	4.50	7.33	6.83	3.91	2.91	1.66	1.00	.66	1.00	.33	2.16	5.25
28	3.83	9.00	6.33	3.75	2.66	1.50	1.00	4.00	1.33	.33	2.00	4.58
29	3.25	......	6.83	3.66	2.50	1.50	.91	2.66	1.16	.41	2.00	3.83
30	3.00	......	7.83	3.50	2.50	1.75	.83	2.50	1.08	.33	1.83	3.00
31	3.00	......	8.08	......	2.50	......	.75	2.16	......	.33	......	2.25
1900.												
1	1.83	2.91	4.00	4.16	4.00	2.58	1.17	1.25	1.00	.04	.83	7.00
2	1.66	1.83	13.12	4.00	3.75	2.50	1.08	1.00	1.00	.04	.83	5.83
3	4.50	3.91	12.33	4.16	3.50	2.33	1.00	1.00	.83	.04	.75	5.25
4	4.91	4.00	9.50	4.41	3.33	2.17	1.08	.92	1.17	.06	.75	4.50
5	4.83	4.66	7.91	5.33	3.08	2.50	1.33	.75	.92	.04	.75	5.00
6	5.25	4.33	6.91	6.00	2.83	2.67	1.17	.67	.83	.04	.66	7.25
7	5.50	5.50	6.00	5.41	2.83	2.50	1.33	.67	.58	.04	.66	7.41
8	5.33	5.00	6.16	5.08	2.75	2.17	1.17	.58	.58	.08	.66	7.08
9	4.91	4.00	6.50	6.16	2.50	2.17	1.42	.50	.58	.04	.75	6.00
10	4.58	4.83	5.83	6.75	2.50	2.08	1.42	.58	.50	.04	.58	5.25
11	4.50	5.75	5.66	6.50	2.42	2.00	1.33	.50	.42	.04	.66	4.75
12	5.50	5.50	6.25	5.58	2.33	2.00	1.17	.33	.33	.04	.50	4.08
13	4.91	5.66	5.75	5.00	2.42	1.92	1.08	.33	.17	.25	.58	3.83
14	5.25	7.66	4.66	4.50	2.42	1.92	1.08	.25	.25	.83	.75	3.60
15	5.25	8.00	4.50	4.33	2.50	2.00	1.00	.17	.25	.83	.66	2.91
16	5.25	8.25	4.00	4.50	2.40	2.17	1.00	.17	.25	.75	.66	2.85
17	4.66	7.41	3.66	4.41	2.33	2.17	1.00	.25	.25	.58	.83	2.25
18	5.00	6.00	3.16	4.33	2.33	2.00	1.08	.17	.17	.66	.91	2.08
19	4.83	4.75	3.00	5.08	2.25	1.83	.92	.17	.08	.66	.75	2.08
20	4.00	3.91	3.00	7.08	2.50	1.83	.92	.17	.12	.58	.91	2.08
21	4.25	2.16	3.91	7.33	2.92	1.82	.83	.33	.08	.50	.91	2.00
22	10.66	3.58	6.87	6.83	2.17	1.75	.75	.42	.07	.50	.91	2.16
23	12.00	9.50	6.83	6.08	2.83	1.75	.75	.83	.06	.50	.83	2.41
24	9.16	11.16	6.00	5.83	2.58	1.58	.75	.50	.04	.50	1.00	2.16
25	7.25	9.75	5.75	6.00	2.42	1.42	.75	1.25	.04	1.00	1.08	2.33
26	6.08	6.83	5.83	6.25	2.25	1.33	.83	1.00	.02	1.08	1.66	2.41
27	5.00	5.50	5.50	5.75	2.17	1.33	1.50	1.17	.00	1.00	5.91	2.00
28	4.50	4.50	5.25	5.08	2.00	1.33	1.25	1.50	−.04	1.25	13.04	2.66
29	4.08	......	4.83	4.58	2.00	1.33	1.25	1.33	−.04	1.16	12.33	2.91
30	3.33	......	4.50	4.17	2.00	1.17	1.42	1.00	+.04	1.00	8.91	2.58
31	2.50	......	4.41	......	1.92	......	1.25	1.08	......	.91	......	2.50

Mean daily gage height, in feet, of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	2.25	2.58	1.75	7.16	5.16	12.58	3.08	1.66	3.50	2.08	1.41	3.08
2	2.08	4.00	1.66	6.00	4.58	10.41	2.83	1.83	3.75	2.41	1.41	3.00
3	1.66	3.33	1.75	5.66	4.50	8.91	2.58	1.75	4.75	2.33	1.33	2.75
4	1.66	3.25	1.83	6.25	4.41	7.83	2.33	1.58	5.16	2.33	1.33	2.75
5	1.75	3.25	2.33	7.50	5.16	7.16	2.25	1.50	4.83	2.33	1.25	3.08
6	1.66	3.08	2.50	7.83	5.00	6.33	2.16	1.25	4.16	2.41	1.25	2.66
7	1.41	3.16	2.58	8.66	4.58	5.50	2.33	1.66	3.58	2.16	1.25	2.75
8	1.16	3.16	2.50	11.41	4.08	5.50	2.16	2.58	3.16	1.83	1.16	2.25
9	1.50	3.16	3.00	12.75	3.75	6.00	2.08	2.75	2.83	1.75	1.16	2.16
10	1.50	3.00	3.25	11.50	3.66	5.75	2.08	2.50	2.50	1.75	1.16	2.58
11	1.66	2.83	6.41	10.00	3.41	5.50	2.00	2.33	2.50	1.66	1.16	4.50
12	2.00	2.91	11.75	8.66	3.83	5.00	1.91	2.75	2.33	1.66	1.00	7.00
13	2.00	2.83	11.83	7.50	4.16	4.66	1.91	2.41	2.41	1.66	1.08	7.00
14	2.50	2.75	9.33	6.91	4.50	4.25	1.83	2.00	2.33	1.83	1.25	6.16
15	3.50	2.75	7.50	6.16	5.16	3.91	1.91	1.75	2.33	2.41	1.33	9.25
16	3.33	2.58	6.66	5.91	5.08	3.50	1.75	1.66	2.25	2.66	1.58	21.41
17	3.41	2.75	6.25	5.75	4.66	3.75	1.66	1.66	2.41	2.50	1.66	18.58
18	2.91	2.58	5.75	5.33	4.16	3.58	2.08	1.75	2.41	2.08	1.91	14.16
19	2.58	2.50	5.25	5.00	4.00	3.50	2.41	5.50	2.50	2.08	1.91	9.83
20	1.75	2.50	5.00	4.75	4.25	3.25	2.25	5.83	2.66	2.00	1.91	7.41
21	1.75	2.08	5.91	5.50	4.08	3.08	2.00	5.00	2.58	2.00	1.75	6.16
22	1.83	2.00	8.50	11.00	4.00	3.25	1.83	4.08	2.58	1.91	1.75	4.83
23	2.00	2.00	9.50	13.58	5.50	3.75	1.75	4.16	2.41	1.91	1.58	3.83
24	1.75	1.91	9.08	12.16	8.41	3.83	1.66	4.75	2.33	1.83	1.83	3.58
25	2.00	1.91	8.00	10.16	7.50	4.00	1.58	7.75	2.08	1.83	2.50	3.75
26	1.75	1.91	7.66	9.16	8.00	3.91	1.50	9.00	2.00	1.66	3.08	3.75
27	2.00	1.75	8.33	8.50	7.50	3.75	1.58	7.25	1.83	1.58	5.41	3.91
28	2.00	1.75	11.75	7.25	7.00	3.50	1.66	5.75	1.75	1.66	5.25	3.91
29	2.00	-------	12.91	6.50	8.75	3.25	1.50	4.75	1.66	1.50	4.00	3.91
30	1.75	-------	11.16	5.75	12.25	3.16	1.50	4.00	1.66	1.41	3.58	5.58
31	1.66	-------	9.00	-------	13.91	-------	1.50	3.50	-------	1.41	-------	6.25
1902.												
1	5.25	3.58	20.33	6.25	2.75	1.75	3.58	5.83	1.25	4.83	5.50	2.41
2	4.75	3.66	23.91	5.58	2.83	1.75	6.16	5.33	1.25	6.00	4.75	2.41
3	4.25	3.50	23.33	5.33	2.83	1.66	7.33	5.50	1.25	5.91	4.50	2.58
4	3.83	3.25	21.41	5.00	2.66	1.66	6.66	6.25	1.25	5.66	4.00	3.33
5	3.00	2.41	16.33	4.75	2.66	1.66	7.83	5.50	1.16	4.66	3.50	3.75
6	3.00	2.00	12.25	4.50	2.83	1.66	7.50	4.83	1.08	4.66	3.50	3.25
7	3.00	6.08	9.50	4.50	2.75	1.50	6.83	4.50	1.00	4.66	3.25	3.50
8	2.83	5.25	7.00	4.50	2.66	1.25	7.33	4.00	.91	4.41	3.08	3.41
9	2.75	5.00	5.25	9.00	2.66	1.50	8.50	3.58	.91	3.83	2.91	3.41
10	3.00	5.08	5.00	14.66	2.66	1.58	7.16	3.25	.91	3.83	2.75	3.16
11	2.91	5.33	6.66	14.16	2.66	1.50	6.16	3.50	.91	3.50	2.66	3.00
12	2.66	5.16	8.33	11.58	2.50	1.50	6.16	3.58	1.25	3.58	2.41	3.00
13	2.58	4.83	10.91	10.91	2.41	1.50	6.25	3.25	1.25	4.75	2.41	3.83
14	2.25	4.41	13.41	8.16	2.33	1.50	5.50	3.08	1.08	4.83	2.33	3.66
15	2.25	4.41	13.58	7.08	2.25	1.75	4.58	2.83	1.16	3.75	2.33	4.00
16	2.25	4.25	12.00	6.41	2.16	1.75	4.00	2.75	1.08	3.91	2.25	4.00
17	2.16	4.08	12.16	5.66	2.16	2.25	3.50	2.50	1.08	3.75	2.16	5.33
18	2.00	3.83	15.00	5.08	2.00	2.41	3.25	2.50	1.00	3.16	2.16	8.58
19	2.00	3.75	13.66	4.75	1.83	2.41	3.25	2.16	1.00	3.33	2.16	8.33
20	2.16	3.75	11.33	4.41	1.83	2.33	3.16	2.00	1.00	3.00	1.91	7.66
21	2.16	3.75	9.50	4.08	1.75	2.16	3.33	2.00	1.00	2.91	1.83	7.16
22	5.16	4.00	6.00	3.83	1.75	2.16	4.33	1.91	.91	2.66	1.75	8.50
23	10.00	4.00	5.50	3.50	1.83	2.16	8.08	1.91	.83	2.58	1.75	12.50
24	6.75	4.08	5.33	3.41	1.66	2.00	8.00	1.75	.83	2.41	1.66	12.66
25	6.50	4.16	5.33	3.25	1.66	2.00	7.25	1.75	.83	2.25	1.66	11.50
26	5.41	6.41	4.66	3.00	1.66	2.00	7.75	1.58	1.66	2.41	1.91	8.25
27	5.08	9.41	3.66	2.91	1.66	2.16	8.08	1.58	3.75	2.33	2.00	7.25
28	5.33	9.66	3.66	2.75	1.66	2.41	6.83	1.50	5.16	2.33	2.25	6.16
29	5.33	-------	4.41	2.75	1.66	2.41	5.83	1.41	4.33	3.66	2.33	5.58
30	4.33	-------	4.41	2.75	1.66	3.00	6.16	1.25	4.33	5.66	2.41	4.83
31	3.91	-------	5.33	-------	1.75	-------	6.16	1.25	-------	6.00	-------	4.58

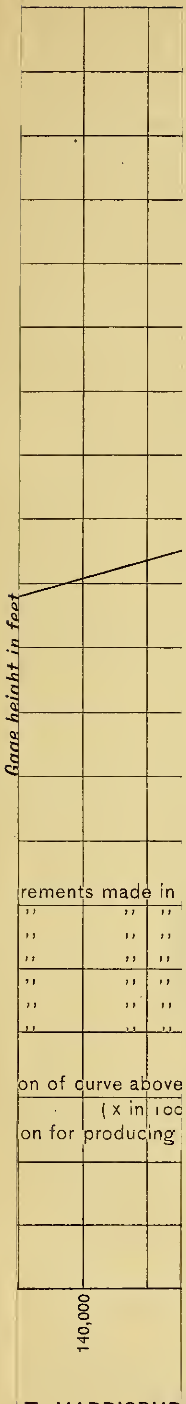
Mean daily gage height, in feet, of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	4.16	11.50	13.41	6.50	3.41	1.50	7.33	3.50	10.29	1.75	3.16	2.50
2	3.66	10.50	16.83	7.25	3.25	1.50	6.00	3.33	8.33	1.75	3.08	2.41
3	3.83	8.75	14.50	7.50	3.00	1.50	5.16	2.91	6.83	1.75	3.00	2.33
4	4.83	8.91	11.00	6.75	2.58	1.50	4.66	2.66	5.66	1.58	2.83	2.16
5	5.58	13.83	9.00	6.50	2.50	1.50	4.08	2.41	5.16	1.58	2.83	2.08
6	5.91	14.58	8.75	5.75	2.33	1.50	4.41	2.50	4.58	1.50	2.66	2.00
7	6.33	12.25	7.66	5.75	2.33	1.50	4.66	2.91	4.00	1.41	2.58	2.00
8	5.83	9.33	8.16	5.75	2.25	1.50	5.33	4.75	3.33	1.83	2.50	2.00
9	5.00	8.25	8.00	5.75	2.16	1.66	5.33	4.66	3.66	2.66	2.50	2.33
10	4.33	7.00	10.58	6.83	2.16	2.25	4.33	4.08	3.83	5.00	2.41	2.16
11	3.41	6.00	12.50	7.00	2.16	2.25	3.83	3.66	3.50	10.66	2.41	1.91
12	2.91	6.16	11.41	6.83	2.16	2.25	3.16	3.50	3.50	11.25	2.41	1.91
13	2.66	6.50	11.91	6.50	2.08	3.16	3.25	3.50	3.50	11.08	2.41	1.91
14	2.25	6.66	10.83	6.50	2.08	3.66	3.25	3.50	3.33	9.25	2.33	2.00
15	2.25	7.50	9.75	8.83	2.08	4.08	2.75	3.00	3.50	7.33	2.33	1.00
16	2.66	7.66	8.33	12.66	2.08	4.33	2.75	3.16	3.16	5.91	2.33	1.00
17	3.00	7.66	7.83	12.75	2.08	4.41	2.58	3.50	2.83	5.16	2.33	1.00
18	3.16	7.00	7.16	10.66	1.83	4.25	2.33	3.33	2.83	4.83	2.50	1.33
19	3.16	6.00	6.50	9.33	1.83	3.83	3.08	3.16	3.16	5.33	8.66	3.16
20	3.16	5.25	6.50	8.00	1.75	3.41	4.50	2.83	3.33	6.50	8.25	4.00
21	3.16	4.08	5.50	6.50	1.75	3.33	5.66	2.58	3.00	6.58	6.50	5.66
22	3.25	4.50	5.66	6.33	1.66	3.33	5.41	2.50	2.83	6.16	6.16	5.58
23	4.16	4.50	6.00	5.83	1.66	3.66	4.33	2.33	2.66	5.50	4.66	5.58
24	4.00	4.33	9.41	5.66	1.66	4.33	3.91	2.41	2.50	4.83	4.33	4.58
25	3.91	4.16	15.16	5.25	1.66	5.58	3.58	2.33	2.41	4.41	4.00	4.41
26	3.50	4.08	14.16	4.58	1.66	6.50	3.16	2.16	2.33	3.66	3.75	4.00
27	3.50	4.58	11.00	4.50	1.66	7.16	3.00	2.16	2.16	3.75	3.33	3.50
28	3.58	5.50	9.58	4.00	1.66	6.50	3.00	2.25	2.08	3.66	2.50	3.08
29	3.75	....	8.16	3.50	1.58	6.00	2.83	4.16	1.83	5.30	2.50	2.91
30	4.66	....	6.83	3.50	1.58	5.50	3.00	5.91	1.83	3.33	2.50	2.66
31	8.08	....	6.83	....	1.50	....	3.33	9.25	....	3.16	....	2.08
1904.[a]												
1	2.16	4.41	9.41	6.40	7.65	3.65	1.90	1.58	1.43	1.78	2.08	1.79
2	2.16	4.16	11.50	10.15	6.65	3.90	1.73	1.68	1.28	1.68	1.98	1.54
3	4.00	4.00	11.91	13.06	6.40	4.23	1.98	1.93	1.23	1.53	1.88	1.44
4	3.16	4.75	13.50	11.15	5.65	4.23	1.90	1.93	1.23	1.78	1.78	1.24
5	3.16	3.41	22.00	9.40	4.90	3.98	1.65	1.88	1.18	1.93	1.68	1.29
6	2.91	4.41	19.41	7.73	4.06	4.90	1.73	1.78	1.13	1.73	1.64	.94
7	2.91	3.75	16.33	6.73	3.98	5.23	1.73	2.08	1.08	1.58	1.60	1.29
8	2.83	3.83	21.16	6.15	3.81	4.73	2.23	2.03	.98	1.48	1.54	1.09
9	2.83	5.50	15.91	6.06	3.48	3.98	2.56	1.78	.98	1.38	1.54	1.24
10	[b]2.83	9.08	15.00	6.40	3.40	3.56	2.56	1.68	1.18	1.23	1.49	1.19
11	3.00	9.33	12.00	8.48	3.15	4.31	4.48	1.88	1.18	1.18	1.59	.84
12	3.58	8.41	9.16	9.15	2.98	5.40	5.06	1.63	1.18	1.23	1.54	.94
13	3.83	9.91	7.91	7.98	2.90	4.65	4.40	1.58	1.13	1.23	1.59	1.69
14	4.91	13.50	6.58	7.15	2.56	3.90	3.73	1.48	1.08	1.23	1.69	1.44
15	4.66	12.50	6.08	6.31	2.81	3.23	3.23	1.33	1.38	1.38	1.64	1.49
16	4.50	11.58	5.58	5.25	3.15	2.90	2.90	1.33	1.58	2.93	1.59	1.39
17	5.00	10.16	5.25	5.15	3.40	2.65	2.56	1.28	1.98	2.73	1.54	1.30
18	5.00	9.91	4.83	5.06	3.65	2.81	2.28	1.23	2.18	2.38	1.49	1.50
19	4.25	9.16	4.66	4.56	3.98	2.81	2.08	1.13	1.78	2.13	1.59	1.50
20	4.08	9.16	4.66	4.48	4.98	2.56	1.98	1.18	1.78	1.88	1.59	1.50
21	4.16	8.66	5.00	3.90	6.06	2.56	2.03	1.28	1.63	1.73	1.49	1.40
22	4.66	9.16	5.58	3.31	6.56	2.65	1.88	1.18	1.43	1.88	1.54	1.40
23	5.50	10.16	6.66	3.73	5.31	2.56	1.93	1.28	1.33	2.93	1.59	1.50
24	[c]15.50	10.16	7.08	3.56	4.56	2.56	2.98	1.28	1.18	3.76	1.69	1.69
25	11.50	10.75	10.41	3.40	4.23	2.73	2.13	1.28	1.18	4.06	1.69	1.69
26	10.16	10.41	11.00	3.48	3.81	2.48	1.83	1.68	1.08	3.58	1.79	1.60
27	7.66	10.58	15.25	3.48	3.98	2.31	1.73	2.33	1.03	3.03	1.89	1.80
28	6.83	9.50	13.83	3.73	3.90	2.06	1.68	2.08	1.13	2.68	1.84	1.90
29	5.83	9.08	12.50	4.90	3.65	1.98	1.78	1.83	1.63	2.53	1.74	2.10
30	4.75	....	10.16	6.98	3.31	1.81	1.68	1.63	1.73	2.48	1.84	9.40
31	4.50	....	8.41	....	3.40	....	1.63	1.53	....	2.28	....	8.40

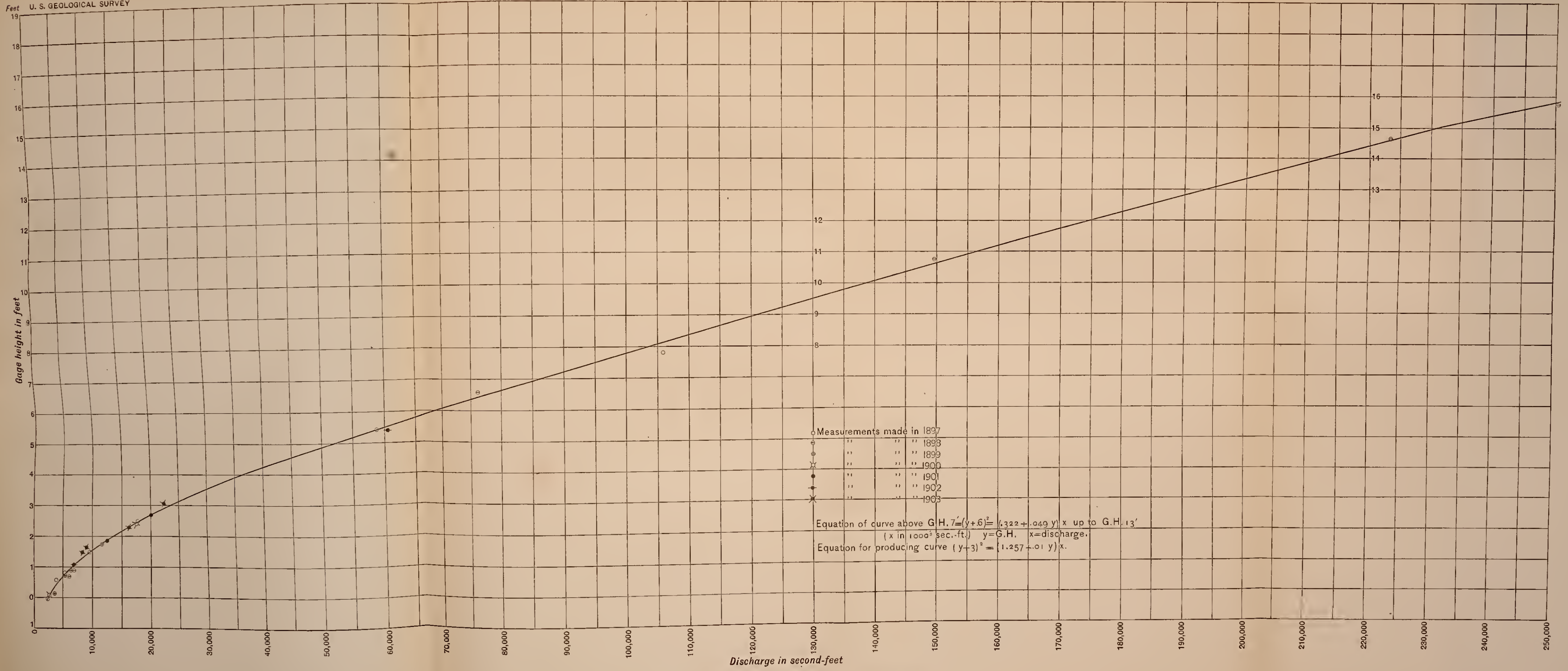
[a] From January 1 to July 17, inclusive, gage readings were taken at the pump house. From July 18 to the end of the year the readings were taken at the Walnut Street Bridge. Beginning with April 1 the readings at the pump house were too high by 0.6 foot, owing to the fact that a cofferdam was built just below the intake. This correction has been applied; therefore the gage readings for the complete year are referred to the low-water datum of 1803.

[b] River frozen over at 5 a. m.

[c] Several ice gorges existed both above and below Harrisburg from January 24 to March 13. These caused the backing up of the water, thus increasing the gage height.



AT HARRISBUR



RATING CURVE FOR SUSQUEHANNA RIVER AT HARRISBURG PA.

Rating table for Susquehanna River at Harrisburg, Pa., from 1891 to 1904.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
−0.05	2,330	2.4	16,950	5.8	65,000	12.0	174,500
+0.0	2,440	2.5	17,960	6.0	68,400	12.5	183,600
.1	2,710	2.6	19,010	6.2	71,900	13.0	193,000
.2	3,000	2.7	20,100	6.4	75,500	13.5	202,500
.3	3,330	2.8	21,210	6.6	79,200	14.0	212,000
.4	3,680	2.9	22,340	6.8	82,900	14.5	221,300
.5	4,070	3.0	23,480	7.0	86,500	15.0	231,000
.6	4,500	3.1	24,620	7.2	90,000	15.5	242,300
.7	4,980	3.2	25,760	7.4	93,400	16.0	254,500
.8	5,500	3.3	26,910	7.6	96,700	16.5	267,400
.9	6,020	3.4	28,130	7.8	100,100	17.0	280,400
1.0	6,550	3.5	29,430	8.0	103,500	17.5	293,600
1.1	7,090	3.6	30,800	8.2	106,900	18.0	306,700
1.2	7,650	3.7	32,200	8.4	110,300	19.0	334,500
1.3	8,240	3.8	33,600	8.6	113,800	20.0	363,100
1.4	8,850	3.9	35,000	8.8	117,300	21.0	392,600
1.5	9,520	4.0	36,400	9.0	120,800	22.0	423,100
1.6	10,200	4.2	39,200	9.2	124,300	23.0	454,600
1.7	10,930	4.4	42,200	9.4	127,800	24.0	487,000
1.8	11,700	4.6	45,400	9.6	131,400	25.0	520,200
1.9	12,500	4.8	48,600	9.8	134,900	26.0	554,400
2.0	13,300	5.0	51,900	10.0	138,400	27.0	589,400
2.1	14,160	5.2	55,100	10.5	147,200		
2.2	15,050	5.4	58,400	11.0	156,300		
2.3	15,980	5.6	61,700	11.5	165,300		

Mean daily discharge, in second-feet, of Susquehanna River at Harrisburg, Pa., 1891–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1891.												
1	21,770	149,000	156,300	107,800	30,800	13,300	20,650	26,330	46,200	11,310	17,960	39,900
2	23,480	165,300	120,800	120,800	29,430	12,500	17,960	25,190	36,400	10,560	17,960	36,400
3	27,510	165,300	92,600	113,800	28,130	13,300	19,010	24,620	31,500	10,560	16,460	31,500
4	43,800	159,000	80,100	116,400	28,130	13,300	25,190	22,340	27,510	10,200	15,510	29,430
5	55,900	141,000	62,500	110,300	26,330	13,300	37,800	23,480	23,480	10,200	15,510	45,400
6	51,900	119,000	62,500	103,500	24,620	13,300	29,430	24,620	23,480	10,200	15,510	116,400
7	60,000	97,600	55,900	89,200	23,480	14,160	24,620	23,480	34,300	10,200	14,600	129,600
8	58,400	95,100	51,900	75,500	23,480	14,600	19,550	27,510	46,200	11,310	14,600	109,400
9	50,200	95,100	46,200	68,400	22,340	19,010	20,650	24,620	43,800	19,010	13,300	86,500
10	43,800	93,400	46,200	62,500	20,650	20,650	19,550	21,770	37,800	23,480	13,300	68,400
11	37,800	95,100	71,000	57,500	19,550	23,480	22,340	20,650	34,300	21,770	13,300	58,400
12	39,900	93,400	88,300	70,100	19,550	20,650	21,770	19,010	29,430	19,550	19,550	51,900
13	68,400	86,500	112,000	92,600	19,010	19,550	20,650	19,010	24,620	19,550	31,500	38,500
14	116,400	75,500	132,300	120,800	17,960	19,550	17,960	19,010	23,480	19,010	36,400	41,400
15	101,800	66,600	151,700	112,000	17,960	19,010	15,510	17,960	23,480	16,950	39,900	36,400
16	95,100	61,700	138,400	103,500	16,950	17,960	14,600	17,960	19,550	16,460	37,800	34,300
17	80,100	66,600	118,200	97,600	16,950	16,950	13,300	17,960	19,550	14,160	32,900	32,900
18	68,400	216,600	99,200	93,400	16,460	16,460	12,100	16,950	19,010	13,300	36,400	31,500
19	62,500	334,500	83,800	83,800	15,510	16,460	12,500	15,510	19,010	12,100	49,400	45,400
20	53,500	302,800	71,000	82,000	15,510	16,460	14,160	16,950	17,960	12,500	47,800	51,900
21	49,400	197,800	66,600	74,600	13,720	27,510	14,160	15,510	15,510	14,600	46,200	47,800
22	43,800	169,800	74,600	66,600	13,300	30,800	14,160	14,160	14,600	17,960	39,900	38,500
23	88,300	165,300	80,100	60,000	14,600	58,400	13,300	13,300	14,160	26,330	38,500	34,300
24	123,400	142,800	105,200	54,300	15,510	71,000	13,300	24,620	14,160	46,200	37,800	35,000
25	129,600	120,800	144,500	51,900	16,460	61,700	41,400	77,300	13,300	38,500	58,400	45,400
26	127,800	107,800	153,500	47,800	15,980	45,400	36,400	79,200	12,500	31,500	75,500	74,600
27	110,300	162,600	140,100	46,200	15,510	41,400	34,300	55,900	12,100	25,190	71,000	107,800
28	95,100	194,900	119,000	39,900	15,050	32,900	27,510	62,500	11,310	23,480	58,400	126,900
29	86,500	....	101,000	37,800	14,600	29,430	23,480	68,400	11,310	21,770	51,900	113,800
30	88,300	....	95,100	34,300	14,160	29,430	20,650	57,500	11,310	19,550	46,200	101,000
31	135,800	....	97,600	....	13,300	....	35,000	54,300	....	19,010	....	112,000
1892.												
1	112,000	21,770	43,800	134,000	23,480	66,600	46,200	12,500	22,340	7,090	4,070	12,500
2	107,800	22,340	36,400	120,800	21,770	60,000	41,400	13,300	17,960	7,940	4,070	12,100
3	116,400	22,340	30,800	112,000	21,770	54,300	32,900	12,100	16,460	8,850	4,070	11,310
4	126,900	24,620	26,330	169,800	21,770	96,700	31,500	13,300	14,600	7,940	4,070	10,200
5	118,200	24,620	23,480	218,600	43,800	183,600	29,430	23,480	13,300	7,090	4,070	10,200
6	103,500	23,480	19,550	224,200	65,800	174,500	30,800	21,770	12,100	7,090	4,070	9,520
7	101,000	23,480	21,770	195,800	96,700	160,800	28,130	21,770	12,100	6,550	4,070	9,520
8	83,800	22,340	21,770	162,600	96,700	120,800	28,130	23,480	11,310	6,550	4,070	9,520
9	57,500	20,650	34,300	129,600	101,000	97,600	28,130	19,550	10,560	6,550	5,240	10,200
10	62,500	17,960	55,900	101,000	80,100	86,500	23,480	16,950	9,520	6,550	6,020	10,560
11	38,500	19,010	71,000	86,500	61,700	93,400	21,770	14,600	9,520	6,550	6,550	16,950
12	31,500	17,960	66,600	75,500	51,900	86,500	17,960	14,160	8,850	6,020	7,370	39,900
13	32,900	13,300	62,500	62,500	47,800	75,500	14,600	16,950	8,850	6,020	7,370	36,400
14	60,000	11,700	51,900	57,500	39,900	58,400	14,600	17,960	9,520	5,760	7,370	29,430
15	171,700	11,310	42,200	47,800	38,500	46,200	16,460	29,430	16,460	5,760	7,940	24,620
16	195,800	12,100	36,400	47,800	38,500	38,500	16,950	38,500	16,460	5,760	7,940	21,770
17	153,500	10,560	29,430	41,400	42,200	32,900	16,950	36,400	14,160	5,760	7,940	22,340
18	122,500	11,310	27,510	41,400	49,400	30,800	15,510	29,430	12,100	5,760	7,940	19,550
19	99,200	13,300	24,620	36,400	50,200	29,430	15,510	21,770	10,560	5,760	12,500	19,010
20	97,600	16,460	23,480	34,300	62,500	29,430	14,160	19,550	9,520	5,760	17,960	17,960
21	86,500	14,600	22,340	31,500	90,800	31,500	13,300	16,460	9,520	5,760	17,960	16,950
22	71,000	17,960	19,550	29,430	107,800	36,400	11,310	14,600	9,520	5,760	22,340	14,160
23	57,500	19,550	17,960	28,130	118,200	31,500	10,560	12,500	8,540	5,760	30,800	9,520
24	47,800	25,190	17,960	29,430	116,400	29,430	10,560	12,100	7,370	5,760	27,510	6,020
25	43,800	29,430	19,550	29,430	107,800	31,500	10,560	12,500	7,370	5,240	22,340	7,090
26	41,400	41,400	29,430	30,800	92,600	38,500	10,200	14,600	7,940	4,500	17,960	19,010
27	30,800	43,800	43,800	30,800	80,100	30,800	9,520	13,300	7,940	4,500	14,160	13,300
28	17,960	49,400	153,500	29,430	77,300	26,330	9,520	13,300	7,940	4,500	13,300	15,510
29	14,160	46,200	193,000	27,510	74,600	29,430	9,520	13,300	7,090	4,500	13,300	15,510
30	21,770	....	174,500	25,190	88,300	49,400	8,850	15,510	7,090	4,500	12,500	15,510
31	21,770	....	149,000	....	75,500	....	10,560	23,480	....	4,070	....	14,600

Mean daily discharge, in second-feet, of Susquehanna River at Harrisburg, Pa., 1891-1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1893.												
1	13,300	19,550	19,010	70,100	50,200	31,500	16,460	6,020	30,800	13,300	14,600	36,400
2	17,960	23,480	19,010	68,400	49,400	31,500	14,600	5,760	38,500	13,300	14,600	34,300
3	21,770	36,400	20,650	75,500	60,000	29,430	14,160	5,760	35,000	12,100	14,600	31,500
4	21,770	38,500	20,650	95,100	83,800	30,800	12,500	5,760	29,430	10,560	14,600	31,500
5	20,650	51,900	20,650	101,800	258,400	30,800	12,500	5,240	19,550	9,520	16,460	31,500
6	19,550	53,500	17,960	119,000	267,400	25,190	10,560	5,240	15,510	9,520	23,480	29,430
7	17,960	51,900	17,960	129,600	223,200	23,480	10,560	4,740	13,300	8,850	26,330	25,190
8	17,960	57,500	19,550	118,200	174,500	23,480	10,200	4,740	11,310	8,850	21,770	23,480
9	17,960	58,400	24,620	103,500	136,600	23,480	9,520	4,500	10,560	8,850	20,650	23,480
10	17,960	75,500	77,300	110,300	107,800	21,770	9,520	4,500	9,520	8,540	17,960	22,340
11	15,510	99,200	183,600	138,400	86,500	19,550	9,520	4,070	9,520	8,540	17,960	21,770
12	15,510	167,100	209,200	127,800	71,000	19,010	9,520	4,070	10,560	8,540	16,950	21,770
13	14,160	95,100	221,300	110,300	60,000	17,960	9,520	3,680	13,300	7,940	16,460	21,770
14	14,160	77,300	223,200	99,200	51,900	16,460	9,520	3,680	13,300	10,560	14,600	17,960
15	14,160	61,700	193,000	93,400	47,800	14,160	11,310	3,680	12,100	46,200	14,160	13,300
16	13,300	55,900	178,900	105,200	45,400	13,300	12,100	3,500	13,300	57,500	13,300	15,510
17	13,300	99,200	147,200	118,200	66,600	12,500	12,100	3,500	17,960	55,900	12,500	16,950
18	13,300	82,000	118,200	119,000	112,000	12,100	10,560	3,500	19,550	39,900	12,100	64,100
19	13,300	65,800	92,600	99,200	134,000	11,310	10,560	3,500	42,200	34,300	11,310	118,200
20	13,300	57,500	80,100	84,700	120,800	11,310	10,560	4,740	31,500	28,130	11,310	88,300
21	13,300	46,200	66,600	86,500	96,700	11,310	10,560	4,500	26,330	23,480	10,560	68,400
22	13,300	39,900	61,700	138,400	86,500	10,200	9,520	4,070	21,770	17,960	10,200	66,600
23	13,300	29,430	62,500	154,400	72,800	10,200	8,850	3,680	17,960	17,960	10,200	42,200
24	13,300	23,480	83,800	147,200	61,700	11,310	8,540	3,680	16,460	16,460	10,560	35,000
25	13,300	23,480	90,800	119,000	58,400	11,310	7,940	3,500	16,460	15,510	10,560	34,300
26	13,300	23,480	99,200	97,600	50,200	13,300	7,370	3,680	14,600	15,510	10,200	34,300
27	13,300	22,340	127,800	83,800	43,800	15,510	7,090	4,070	13,300	15,510	10,200	49,400
28	13,300	20,650	114,600	71,000	41,400	17,960	7,090	4,070	13,300	13,300	11,310	66,600
29	13,300	......	101,000	62,500	38,500	20,650	12,100	6,550	13,300	13,300	21,770	65,800
30	16,460	......	101,000	54,300	35,000	17,960	6,020	23,480	13,300	13,300	31,500	54,300
31	17,960	......	77,300	......	31,500	......	6,020	24,620	......	14,600	......	46,200
1894.												
1	43,800	16,950	25,190	34,300	45,400	129,600	19,010	7,090	3,500	12,500	53,500	16,950
2	43,800	16,460	27,510	31,500	43,800	132,300	16,950	7,090	3,500	12,100	55,900	16,460
3	36,400	15,510	29,430	29,430	38,500	123,400	16,460	8,540	3,500	10,200	58,400	17,960
4	31,500	14,600	32,900	26,330	34,300	113,800	15,510	9,520	3,500	10,200	95,100	22,340
5	29,430	14,160	37,800	25,190	29,430	110,300	13,300	10,560	3,160	8,850	97,600	29,430
6	27,510	13,300	62,500	23,480	25,190	101,800	13,300	10,200	3,160	8,850	96,700	30,800
7	28,130	13,300	97,600	22,340	26,330	82,000	12,100	9,520	3,500	8,540	89,200	30,800
8	54,300	13,000	162,600	21,770	27,510	68,400	12,100	9,520	3,500	8,540	86,500	27,510
9	55,900	14,160	177,100	20,650	29,430	60,000	11,310	7,090	3,680	7,940	77,300	23,480
10	45,400	29,430	153,500	20,650	29,430	51,900	10,560	7,090	6,550	8,540	68,400	23,480
11	32,900	51,900	112,000	21,770	29,430	46,200	10,200	7,090	12,500	14,160	60,000	27,510
12	27,510	68,400	135,800	23,480	24,620	36,400	9,520	6,550	9,520	50,200	57,500	36,400
13	17,960	62,500	89,200	26,330	22,340	32,900	8,850	6,550	8,540	61,700	46,200	41,400
14	25,190	45,400	86,500	31,500	20,650	31,500	8,850	6,550	7,940	53,500	43,800	64,100
15	25,190	41,400	75,500	74,600	17,960	31,500	8,540	6,550	7,940	46,200	36,400	71,000
16	21,770	31,500	65,800	96,700	17,960	30,800	8,540	6,550	7,370	38,500	35,000	74,600
17	19,550	27,510	60,000	122,500	16,460	28,130	7,940	6,550	7,090	34,300	31,500	64,100
18	21,770	27,510	53,500	122,500	16,460	25,190	7,370	6,550	7,090	31,500	29,430	54,300
19	21,770	27,510	49,400	112,000	16,460	23,480	7,090	6,020	14,600	28,200	26,330	46,200
20	23,480	38,500	45,400	95,100	57,500	29,430	7,090	6,020	37,800	23,400	25,190	41,400
21	21,770	62,500	43,800	82,000	263,600	28,130	7,090	5,760	51,900	20,610	24,620	37,800
22	21,770	57,500	41,400	112,000	543,500	24,620	7,090	5,760	60,000	17,780	26,330	34,300
23	19,010	54,300	43,800	127,800	405,100	21,770	6,550	5,240	62,500	16,460	25,190	30,800
24	16,950	41,400	46,200	131,400	236,600	17,960	7,090	5,240	49,400	14,600	23,480	29,430
25	16,950	27,510	60,000	136,600	171,700	17,960	7,940	5,240	36,400	16,460	23,480	27,510
26	16,950	22,340	86,500	120,800	162,600	19,550	8,850	5,240	28,130	30,800	21,770	24,620
27	16,950	16,460	74,600	90,800	168,000	19,010	9,520	4,740	23,480	47,800	19,550	23,480
28	17,960	17,960	60,000	68,400	129,600	19,550	9,520	4,740	19,010	49,400	19,010	23,420
29	19,010	......	50,200	58,400	101,800	16,950	8,850	4,500	15,510	41,400	19,010	36,400
30	19,010	......	41,400	51,900	86,500	20,650	7,370	4,070	14,160	36,400	17,960	31,500
31	17,960	......	36,400	......	95,100	......	7,090	3,680	......	32,900	......	31,500

Mean daily discharge, in second-feet, of Susquehanna River at Harrisburg, Pa., 1891-1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1895.												
1	35,000	22,340	68,400	64,100	28,130	19,550	21,770	4,500	5,240	3,680	3,000	24,620
2	36,400	21,770	113,800	62,500	27,510	19,010	19,550	4,740	5,240	3,680	3,000	24,620
3	39,900	23,480	105,200	71,000	26,330	17,960	22,340	4,740	4,740	3,500	3,160	20,650
4	41,400	23,480	147,200	83,800	23,480	15,510	17,960	4,740	4,740	3,500	3,160	17,960
5	41,400	86,500	101,000	80,100	20,650	14,160	15,510	4,500	4,500	3,500	3,500	15,510
6	41,400	62,500	97,600	71,000	19,550	12,500	13,300	4,070	4,500	3,500	3,680	13,300
7	41,400	64,100	80,100	68,400	17,960	12,100	12,500	4,070	5,240	3,500	3,680	12,500
8	43,800	62,500	72,800	64,100	16,950	11,310	11,310	5,760	5,240	3,160	3,680	12,500
9	47,800	60,000	65,800	105,200	15,510	11,310	10,200	5,240	4,740	3,160	3,680	12,500
10	71,000	60,000	71,000	174,500	20,650	10,200	9,520	6,550	4,070	3,000	3,680	12,100
11	93,400	61,700	71,000	205,400	23,480	8,540	9,520	7,090	6,550	3,000	3,680	9,520
12	101,000	66,600	74,600	183,600	27,510	8,850	8,850	7,090	9,520	3,000	3,870	9,520
13	112,000	65,800	71,000	154,400	31,500	8,540	8,540	7,090	10,200	3,500	4,070	6,280
14	101,000	65,800	68,400	129,600	41,400	7,940	8,540	6,020	8,850	3,330	4,500	5,240
15	82,000	62,500	77,300	138,400	41,400	7,940	7,940	8,540	6,550	3,330	4,500	6,550
16	72,800	61,700	82,000	134,000	38,500	7,940	7,940	8,540	5,760	3,160	4,500	6,550
17	64,100	60,000	80,100	116,400	37,800	7,940	7,090	7,090	4,740	3,160	4,740	8,540
18	58,400	60,000	74,600	96,700	31,500	7,940	6,550	6,550	4,500	3,680	5,760	8,540
19	51,900	57,500	62,500	80,100	29,430	7,940	6,020	6,550	4.740	4,500	6,550	8,540
20	43,800	55,900	60,000	68,400	27,510	7,940	6,020	6,020	4,740	4,070	6,550	8,540
21	42,200	54,300	57,500	60,000	25,190	7,370	5,760	5,760	4,740	3,680	6,020	9,520
22	41,400	53,500	54,300	51,900	24,620	6,550	5,760	4,500	4,500	3,680	5,500	12,100
23	36,400	51,900	51,900	45,400	22,340	5,240	5,760	4,070	4,500	3,500	4,740	13,300
24	36,400	50,200	51,900	41,400	20,650	5,240	5,760	4,070	4,500	3,160	5,240	19,550
25	27,510	47,800	51,900	36,400	19,010	5,240	5,760	3,680	4,500	3,160	5,240	20,650
26	26,330	45,400	65,800	32,900	17,960	9,520	5,760	3,500	4,070	3,000	5,240	21,770
27	24,620	43,800	103,500	30,800	17,960	9,520	5,760	3,500	4,070	2,850	5,240	27,510
28	24,620	47,800	120,800	32,900	16,950	9,520	5,760	3,500	3,680	2,710	19,550	29,430
29	24,620	-------	103,500	32,900	16,950	13,300	5,240	3,500	3,680	2,710	21,770	53,500
30	26,330	-------	89,200	29,430	24,620	29,430	4,500	3,500	3,680	2,570	21,770	62,500
31	23,480	-------	74,600	-------	23,480	-------	3,680	4,070	-------	2,570	-------	62,500
1896.												
1	136,600	43,800	89,200	223,200	23,480	9,520	19,550	46,200	3,500	58,400	14,160	35,000
2	123,400	32,900	123,400	223,200	23,480	9,520	16,950	41,400	3,500	39,900	12,500	35,000
3	110,300	30,800	134,000	207,200	21,770	11,310	14,160	34,300	3,500	36,400	12,100	34,300
4	77,300	30,800	110,300	180,800	21,770	12,100	12,100	32,900	3,500	25,190	12,100	27,510
5	53,500	29,430	89,200	147,200	19,550	10,560	11,310	31,500	3,160	19,550	12,100	23,480
6	36,400	36,400	60,000	118,200	17,960	10,560	10,560	30,800	3,160	14,160	90,800	20,650
7	34,300	165,300	51,900	90,800	16,950	10,560	14,600	17,960	3,160	12,100	140,100	19,550
8	23,480	183,600	47,800	77,300	14,600	10,200	13,300	16,460	3,160	10,560	99,200	17,960
9	46,200	144,500	43,800	71,000	14,160	8,850	12,500	16,460	3,160	9,520	77,300	17,960
10	41,400	112,000	49,400	65,800	13,300	11,310	16,460	15,510	3,160	9,520	62,500	19,550
11	37,800	83,800	53,500	60,000	13,300	17,960	20,650	15,510	3,160	9,520	47,800	28,130
12	36,400	57,500	46,200	60,000	12,500	19,010	20,650	13,300	3,160	9,520	42,200	32,900
13	35,000	50,200	36,400	68,400	11,310	28,130	17,960	12,100	3,160	12,500	38,500	36,400
14	36,400	39,900	29,430	75,500	10,560	26,330	14,600	10,560	3,500	92,600	36,400	39,900
15	34,300	32,900	19,550	103,500	10,560	22,340	13,300	10,560	3,500	86,500	34,300	34,300
16	34,300	32,900	19,550	110,300	11,310	19,010	12,100	10,200	3,500	129,600	31,500	31,500
17	32,900	34,300	16,460	106,000	10,200	19,010	10,560	10,200	4,070	97,600	29,430	28,130
18	30,800	30,800	17,960	92,600	9,520	21,770	10,200	10,200	4,070	61,700	27,510	24,620
19	31,500	22,340	25,190	83,800	9,520	19,550	10,560	8,540	4,500	49,400	25,190	22,340
20	36,400	23,480	36,400	74,600	9,520	23,480	10,560	7,940	4,500	37,800	23,480	19,010
21	31,500	16,460	68,400	64,100	9,520	25,190	12,500	6,550	4,740	30,800	21,770	16,460
22	29,430	31,500	64,100	55,900	8,850	23,480	10,560	5,760	5,760	28,130	19,550	13,300
23	29,430	58,400	64,100	49,400	8,850	16,950	10,200	5,760	7,370	26,330	19,010	13,300
24	29,430	58,400	72,800	45,400	8,850	16,460	10,560	5,760	7,370	23,480	17,960	9,520
25	36,400	28,130	61,700	41,400	8,540	15,510	10,560	5,760	6,020	23,480	17,960	9,520
26	90,800	29,430	51,900	37,800	7,940	19,550	11,310	5,240	5,240	23,480	16,460	9,520
27	92,600	31,500	55,900	36,400	7,370	47,800	12,500	5,240	4,500	20,650	16,460	9,520
28	71,000	25,190	70,100	30,800	7,940	36,400	17,960	4,740	4,070	19,550	16,950	9.520
29	68,400	25,190	77,300	28,130	9,520	29,430	17,960	4,500	3,680	17,960	19,550	8,540
30	64,100	-------	125,200	26,330	9,520	24,620	32,900	4,070	6,760	16,950	29,430	10,200
31	58,400	-------	183,600	-------	9,520	-------	41,400	3,500	-------	15,510	-------	11,310

Mean daily discharge, in second-feet, of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1897.												
1	12,100	27,510	39,900	51,900	24,620	22,340	8,850	36,400	7,940	11,310	4,740	51,900
2	13,300	25,190	31,500	46,200	24,620	21,770	8,540	41,400	7,090	9,520	4,370	43,800
3	13,300	25,190	26,330	41,400	60,000	19,550	7,940	34,300	6,550	8,540	24,620	36,400
4	14,160	25,190	34,300	38,500	77,300	19,010	7,940	26,330	6,550	7,370	37,800	32,900
5	17,960	24,620	50,200	36,400	95,100	19,550	7,940	21,770	6,550	7,090	29,430	27,510
6	23,480	23,480	66,600	34,300	88,300	23,480	7,940	19,550	6,020	6,550	24,620	47,800
7	31,500	39,900	97,600	32,900	86,500	19,550	8,850	16,950	5,760	6,550	23,480	54,300
8	31,500	95,100	113,800	32,900	74,600	17,960	8,850	19,550	5,760	6,020	20,650	53,500
9	31,500	79,200	103,500	32,900	60,000	19,550	7,940	17,960	5,760	5,760	17,960	58,400
10	27,510	58,400	84,700	66,600	49,400	19,550	7,940	14,160	4,740	4,740	16,950	50,200
11	24,620	49,400	77,300	120,800	43,800	19,550	7,370	14,160	4,500	4,740	19,550	41,400
12	21,770	43,800	90,800	129,600	36,400	19,550	7,090	13,300	4,740	4,500	19,550	38,500
13	16,950	35,000	114,600	103,500	36,400	24,620	6,550	12,100	4,740	5,240	17,960	38,500
14	13,300	34,300	110,300	83,800	68,400	29,430	7,090	11,310	4,740	5,240	17,960	41,400
15	13,300	34,300	99,200	68,400	99,200	26,330	6,550	10,200	4,070	5,240	17,960	45,400
16	13,300	29,430	86,500	68,400	101,800	22,340	6,550	10,200	4,500	5,240	17,960	79,200
17	13,300	29,430	84,700	79,200	92,600	19,550	7,370	9,520	4,740	4,740	17,960	97,600
18	14,600	27,510	60,000	86,500	77,300	17,960	7,370	9,520	5,240	4,740	19,550	106,000
19	16,460	30,800	51,900	79,200	64,100	15,510	7,090	8,850	5,240	4,500	22,340	92,500
20	13,300	37,800	57,500	68,400	51,900	14,600	7,090	8,850	4,740	4,500	28,130	74,600
21	12,100	36,400	93,400	60,000	39,900	14,600	9,520	8,540	4,500	4,070	26,330	61,700
22	12,100	39,900	107,800	50,200	39,900	14,600	9,520	7,370	4,500	4,500	25,190	51,900
23	12,500	66,600	134,000	43,800	30,800	13,300	8,540	7,370	4,500	5,240	21,770	37,800
24	10,560	101,800	129,600	38,500	29,430	12,100	8,850	7,940	6,550	5,240	17,960	34,300
25	10,560	95,100	141,000	34,300	32,900	11,310	10,200	10,560	9,520	6,550	17,960	28,130
26	9,520	77,300	165,300	31,500	32,900	11,310	11,310	19,550	9,520	6,550	17,960	21,770
27	27,510	60,000	149,900	30,800	29,430	10,560	11,310	14,160	12,100	6,550	16,460	20,650
28	27,510	43,800	103,500	29,430	30,800	10,200	14,600	11,310	12,500	6,020	17,960	19,550
29	23,480	-------	93,400	27,510	35,000	10,200	34,300	10,200	15,510	5,760	29,430	19,550
30	26,330	-------	74,600	25,190	29,430	9,520	43,800	9,520	13,300	5,240	50,200	19,010
31	27,510	-------	61,700	-------	26,330	-------	37,800	8,540	-------	5,240	-------	17,960
1898.												
1	19,550	35,000	46,200	114,600	68,400	41,400	13,300	8,850	19,550	5,240	46,200	24,620
2	16,460	28,130	41,400	93,400	58,400	38,500	14,600	9,520	16,460	5,240	36,400	25,190
3	14,600	23,480	38,500	75,500	49,400	35,000	13,300	8,850	23,480	4,740	31,500	24,620
4	19,550	19,550	35,000	64,100	46,200	30,800	11,310	16,460	17,960	4,740	29,430	23,480
5	12,500	19,550	31,500	58,400	42,200	27,510	10,560	45,400	14,160	4,740	25,190	31,500
6	12,500	19,550	30,800	50,200	43,000	23,480	10,200	57,500	12,500	4,740	23,480	51,900
7	15,510	19,550	29,430	43,800	46,200	21,770	9,520	36,400	10,560	4,740	22,340	43,800
8	17,960	24,620	29,430	42,200	60,000	19,550	8,850	29,430	10,560	6,550	17,960	37,800
9	19,550	28,130	27,510	38,500	72,800	17,960	8,540	24,620	10,560	8,540	17,960	34,300
10	20,650	29,430	27,510	34,300	61,700	17,960	7,940	31,500	13,300	8,850	19,960	30,800
11	23,480	28,130	34,300	31,500	54,300	16,460	7,370	39,900	21,770	15,510	19,010	24,620
12	23,480	32,900	50,200	29,430	47,800	16,460	7,090	32,900	20,650	16,950	36,400	17,960
13	27,510	42,200	77,300	27,510	43,800	15,510	6,550	27,510	19,010	16,460	116,400	15,510
14	36,400	97,600	114,600	26,330	36,400	15,510	6,020	19,550	14,160	13,300	103,500	15,510
15	85,600	106,000	135,800	25,190	36,400	16,950	5,720	17,960	12,500	13,300	79,200	14,160
16	105,200	95,100	126,900	31,500	39,900	20,650	5,760	15,510	11,310	14,160	60,000	13,300
17	101,000	77,300	105,200	37,800	54,300	26,330	5,240	13,300	8,850	14,600	49,400	13,300
18	96,700	65,800	89,200	35,000	70,100	23,480	4,740	12,500	8,540	26,330	41,400	12,500
19	79,200	51,900	74,600	31,500	57,500	19,550	4,740	16,460	7,370	32,900	38,500	13,300
20	65,800	41,400	65,800	29,430	60,000	16,950	5,240	23,480	6,550	36,400	38,500	17,960
21	64,100	46,200	92,600	28,130	80,100	16,460	6,020	42,200	6,020	41,400	39,900	22,340
22	71,000	83,800	125,200	27,510	80,100	16,460	5,240	41,400	6,020	39,900	45,400	24,620
23	93,400	84,700	154,400	25,190	77,300	14,160	6,020	32,900	6,020	92,600	49,400	29,430
24	125,200	99,200	245,900	23,480	68,400	13,300	5,760	28,130	5,760	109,400	46,200	58,400
25	147,200	80,100	236,600	29,430	86,500	14,600	5,760	23,480	5,760	93,400	41,400	101,000
26	129,600	72,800	168,000	80,100	77,300	14,160	5,760	19,550	5,240	71,000	36,400	97,600
27	103,500	62,500	125,200	144,500	77,300	13,300	8,540	17,960	6,020	62,500	35,000	74,600
28	86,500	51,900	99,200	129,600	71,000	12,500	7,370	16,950	6,020	61,700	31,500	57,500
29	70,100	-------	80,100	106,000	64,100	12,100	12,100	38,500	5,240	62,500	29,430	49,400
30	60,000	-------	86,500	80,100	57,500	10,560	10,200	34,300	5,240	70,100	27,510	41,400
31	49,400	-------	120,800	-------	50,200	-------	8,540	23,480	-------	57,500	-------	34,300

Mean daily discharge, in second-feet, of Susquehanna River at Harrisburg, Pa., 1891-1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1	26,330	17,960	110,300	90,800	28,130	17,960	11,310	5,240	12,100	7,090	4,070	11,310
2	25,190	13,300	106,000	75,500	24,620	19,010	10,560	5,240	9,520	5,760	10,560	10,200
3	20,650	12,500	101,000	65,800	24,620	17,960	10,560	5,240	7,940	5,760	17,960	9,520
4	26,330	15,510	93,400	57,500	28,130	17,960	9,520	5,240	7,090	5,240	26,330	9,520
5	29,430	19,010	103,500	50,200	25,190	17,960	8,540	5,240	7,090	4,740	43,800	9,520
6	51,900	19,550	183,600	42,200	25,190	16,460	7,940	6,020	6,550	4,740	35,000	9,520
7	103,500	21,770	193,000	39,900	23,480	14,160	7,940	5,240	6,020	4,500	32,900	9,520
8	83,800	16,950	163,500	47,800	20,650	12,500	7,370	5,240	6,020	4,500	25,190	9,520
9	70,100	17,960	125,200	83,800	21,770	12,500	7,370	5,760	5,760	4,500	21,770	9,520
10	58,400	16,950	97,600	116,400	19,550	12,500	7,370	5,240	6,550	4,740	17,960	9,520
11	45,400	16,950	77,300	110,300	20,650	11,310	8,850	4,740	6,550	4,500	15,510	9,520
12	36,400	42,200	64,100	99,200	20,650	10,560	7,940	4,740	5,240	4,500	14,600	9,520
13	27,510	42,200	64,100	82,000	22,340	10,560	7,370	7,090	5,760	4,070	14,160	20,650
14	25,190	45,400	95,100	82,000	21,770	10,200	7,370	7,090	8,850	4,070	13,300	60,000
15	27,510	45,400	110,300	103,500	19,010	9,520	7,370	7,940	7,940	4,070	15,510	74,600
16	31,500	46,200	103,500	103,500	17,960	9,520	7,090	6,020	5,760	3,680	16,950	68,400
17	49,400	49,400	93,400	101,000	17,960	8,850	6,550	4,740	5,240	3,680	16,950	57,500
18	86,500	49,400	75,500	92,600	19,010	7,940	7,940	4,740	5,240	3,680	16,950	45,400
19	74,600	50,200	41,400	83,800	32,900	7,940	7,940	4,070	4,500	3,680	21,770	37,800
20	62,500	47,800	89,200	68,400	47,800	7,940	7,940	4,070	4,740	3,500	23,480	32,900
21	50,200	50,200	112,000	58,400	54,300	7,370	7,940	4,070	5,240	3,500	22,340	32,900
22	41,400	57,500	106,000	53,500	39,900	7,090	8,540	4,070	4,740	3,500	19,010	34,300
23	39,900	95,100	95,100	50,200	35,000	6,550	8,540	4,070	4,740	3,500	17,960	43,800
24	37,800	95,100	89,200	43,800	30,800	8,850	8,540	4,070	4,740	2,850	15,510	39,900
25	38,500	89,200	93,400	42,200	25,190	13,300	7,370	4,070	4,740	2,850	15,510	65,800
26	55,900	83,800	93,400	36,400	23,480	10,560	6,550	3,680	4,740	3,160	15,510	82,000
27	43,800	92,600	83,800	35,000	22,340	9,520	6,550	4,740	6,550	3,500	14,600	55,900
28	34,300	120,800	92,600	32,900	19,550	9,520	6,550	36,400	8,540	3,500	13,300	45,400
29	26,330	-------	120,800	31,500	17,960	11,310	6,020	19,550	7,370	3,680	13,300	34,300
30	23,480	-------	-------	29,430	17,960	-------	5,760	17,960	7,090	3,500	12,100	33,480
31	23,480	-------	-------	-------	17,960	-------	5,240	14,600	-------	3,500	-------	15,510
1900.												
1	12,100	22,340	36,400	38,500	36,400	19,010	7,370	7,940	6,550	2,570	5,760	86,500
2	10,560	12,100	194,900	36,400	32,900	17,960	7,090	6,550	6,550	2,570	5,760	65,800
3	43,800	35,000	180,800	38,500	29,430	16,460	6,550	6,550	5,760	2,570	5,240	55,900
4	50,200	36,400	129,600	42,200	27,510	14,600	7,090	6,020	7,370	2,570	5,240	43,800
5	49,400	46,200	101,800	57,500	24,620	17,960	8,540	5,240	6,020	2,570	5,240	51,900
6	55,900	41,400	84,700	68,400	21,770	19,550	7,370	4,740	5,760	2,570	4,740	90,800
7	60,000	60,000	68,400	58,400	21,770	17,960	8,540	4,740	4,500	2,570	4,740	93,400
8	57,500	51,900	71,000	53,500	20,650	14,600	7,370	4,500	4,500	2,710	4,740	88,330
9	50,200	36,400	77,300	71,000	17,960	14,600	8,850	4,070	4,500	2,570	5,240	68,400
10	45,400	49,400	65,800	82,000	17,960	14,160	8,850	4,500	4,070	2,570	4,500	55,900
11	43,800	64,100	62,500	77,300	16,950	13,300	8,540	4,070	3,680	2,570	4,740	47,800
12	60,000	60,000	72,800	61,700	16,460	13,300	7,370	3,500	3,500	2,570	4,070	37,800
13	50,200	62,500	64,100	51,900	16,950	12,500	7,090	3,500	2,850	3,160	4,500	34,300
14	55,900	97,600	46,200	43,800	16,950	12,500	7,090	3,160	3,160	5,760	5,240	30,800
15	55,900	103,500	43,800	41,400	17,960	13,300	6,550	2,850	3,160	5,760	4,740	22,340
16	55,900	107,800	36,400	43,800	16,950	14,600	6,550	2,850	3,160	5,240	4,740	21,770
17	46,200	93,400	31,500	42,200	16,460	14,600	6,550	3,160	3,160	4,500	5,760	15,510
18	51,900	68,400	25,190	41,400	16,460	13,300	7,090	2,850	2,850	4,740	6,020	14,160
19	49,400	47,800	23,480	53,500	15,510	12,100	6,020	2,850	2,710	4,740	5,240	14,160
20	36,400	35,000	23,480	88,300	17,960	12,100	6,020	2,850	2,710	4,500	6,020	14,160
21	39,900	14,600	35,000	92,600	22,340	11,700	5,760	3,500	2,710	4,070	6,020	13,300
22	149,900	30,800	83,800	83,800	14,600	11,310	5,240	3,680	2,570	4,070	6,020	14,600
23	174,500	129,600	83,800	70,100	21,770	11,310	5,240	5,760	2,570	4,070	5,760	16,950
24	123,400	159,000	68,400	65,800	19,010	10,200	5,240	4,070	2,570	4,070	6,550	14,600
25	90,800	134,000	64,100	68,400	16,950	8,850	5,240	7,940	2,570	6,550	7,090	16,460
26	70,100	83,800	65,800	72,800	15,510	8,540	5,760	6,550	2,440	7,090	10,560	16,950
27	51,900	60,000	60,000	64,100	14,600	8,540	9,520	7,370	2,440	6,550	66,600	13,300
28	43,800	43,800	55,900	53,500	13,300	8,540	7,940	9,520	2,330	7,940	194,000	19,550
29	37,800	-------	49,400	45,400	13,300	8,540	7,940	8,540	2,330	7,370	180,800	22,340
30	27,510	-------	43,800	38,500	13,300	7,370	8,850	6,550	2,570	6,550	119,000	19,010
31	17,960	-------	42,200	-------	12,500	-------	7,940	7,090	-------	6,020	-------	17,960

Mean daily discharge, in second-feet, of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	15,510	19,000	11,310	89,200	54,300	185,500	24,620	10,560	29,430	14,160	8,850	24,620
2	14,160	36,400	10,560	68,400	45,400	145,400	21,770	12,100	32,900	16,950	8,850	23,480
3	10,560	27,580	11,310	62,500	43,800	119,000	19,010	11,310	47,800	16,460	8,540	20,650
4	10,560	26,360	12,100	72,800	42,200	101,000	16,460	10,200	54,300	16,460	8,540	20,650
5	11,310	26,360	16,460	95,100	54,300	89,200	15,510	9,520	49,400	16,460	7,940	24,620
6	10,560	24,570	17,960	101,000	51,900	74,600	14,600	7,940	38,500	16,950	7,940	19,550
7	8,850	25,160	19,010	114,600	45,400	60,000	16,460	10,560	30,800	14,600	7,940	20,650
8	7,370	25,160	17,960	163,500	37,800	60,000	14,600	19,010	25,190	12,100	7,370	15,510
9	9,520	25,160	23,480	188,400	32,900	68,400	14,160	20,650	21,770	11,310	7,370	14,600
10	9,520	23,400	26,330	165,300	31,500	64,100	14,160	17,960	17,960	11,310	7,370	19,010
11	10,560	21,700	75,500	138,400	28,130	60,000	13,300	16,460	17,960	10,560	7,370	43,800
12	13,300	22,250	169,800	114,600	34,300	51,900	12,500	20,650	16,460	10,560	6,550	86,500
13	13,300	21,700	171,700	95,100	38,500	46,200	12,500	16,950	16,950	10,560	7,090	86,500
14	17,960	20,610	126,900	84,700	43,800	39,900	12,100	13,300	16,460	12,100	7,940	71,000
15	29,430	20,610	95,100	71,000	54,300	35,000	12,500	11,310	16,460	16,950	8,540	125,200
16	27,510	19,000	80,100	66,600	53,500	29,430	11,310	10,560	15,510	19,550	10,200	405,100
17	28,130	20,610	72,800	64,100	46,200	32,900	10,560	10,560	16,950	17,960	10,560	322,700
18	22,340	19,000	64,100	57,500	38,500	30,800	14,160	11,310	16,950	14,160	12,500	214,800
19	19,010	17,780	55,900	51,900	36,400	29,430	16,950	60,000	17,960	14,160	12,500	135,800
20	11,310	17,780	51,900	47,800	39,900	26,330	15,510	65,800	19,550	13,300	12,500	93,400
21	11,310	14,160	66,600	60,000	37,800	24,620	13,300	51,900	19,010	13,300	11,310	71,000
22	12,100	13,300	112,000	156,300	36,400	26,330	12,100	37,800	19,010	12,500	11,310	49,400
23	13,300	13,300	129,600	204,400	60,000	32,900	11,310	38,500	16,950	12,500	10,200	34,300
24	11,310	12,500	122,500	177,100	110,300	34,300	10,560	47,800	16,460	12,100	12,100	30,800
25	13,300	12,500	103,500	141,000	95,100	36,400	10,200	99,200	14,160	12,100	17,960	32,900
26	11,310	12,500	97,600	123,400	103,500	35,000	9,520	120,800	13,300	10,560	24,620	32,900
27	13,300	11,310	109,400	112,000	95,100	32,900	10,200	90,800	12,100	10,200	58,400	35,000
28	13,300	11,310	169,800	90,800	86,500	29,430	10,560	64,100	11,310	10,560	55,900	35,000
29	13,300	......	191,100	77,300	116,400	26,330	9,520	47,800	10,560	9,520	36,400	35,000
30	11,310	......	159,000	64,100	178,900	25,190	9,520	36,400	10,560	8,850	30,800	61,700
31	10,560	......	120,800	......	210,100	......	9,520	29,430	......	8,850	......	72,800
1902.												
1	55,900	30,800	372,800	72,800	20,650	11,310	30,800	65,800	7,940	49,400	60,000	16,950
2	47,800	31,500	484,100	61,700	21,770	11,310	71,000	57,500	7,940	68,400	47,800	16,950
3	39,900	29,430	465,300	57,500	21,770	10,560	92,000	60,000	7,940	66,600	43,800	19,010
4	34,300	26,330	405,100	51,900	19,550	10,560	80,100	72,800	7,940	62,500	36,400	27,510
5	23,480	16,950	263,600	47,800	19,550	10,560	101,000	60,000	7,370	46,200	29,430	32,900
6	23,480	13,300	178,900	43,800	21,770	10,560	95,100	49,400	7,090	46,200	29,430	26,330
7	23,480	70,100	129,600	43,800	20,650	9,520	83,800	43,800	6,550	46,200	26,330	29,430
8	21,770	55,900	86,500	43,800	19,550	7,940	92,600	36,400	6,020	42,200	24,620	28,130
9	20,650	51,900	55,900	120,800	19,550	9,520	112,000	30,800	6,020	34,300	22,340	28,130
10	23,480	53,500	51,900	224,200	19,550	10,200	89,200	26,330	6,020	34,300	20,650	25,190
11	22,340	57,500	80,100	214,800	19,550	9,520	71,000	29,430	6,020	29,430	19,550	23,480
12	19,550	54,300	109,400	167,100	17,960	9,520	71,000	30,800	7,940	30,800	16,950	23,480
13	19,010	49,400	154,400	154,400	16,950	9,520	72,800	26,330	7,940	47,800	16,950	34,300
14	15,510	42,200	200,600	106,000	16,460	9,520	60,000	24,620	7,090	49,400	16,460	31,500
15	15,510	42,200	204,400	88,300	15,510	11,310	45,400	21,770	7,370	32,900	16,460	36,400
16	15,510	39,900	174,500	75,500	14,600	11,310	36,400	20,650	7,090	35,000	15,510	36,400
17	14,600	37,800	177,100	62,500	14,600	15,510	29,430	17,960	7,090	32,900	14,600	57,500
18	13,300	34,300	231,000	53,500	13,300	16,950	36,330	17,960	6,550	25,190	14,600	113,800
19	13,300	32,900	205,400	47,800	12,100	16,950	26,330	14,600	6,550	27,510	14,600	109,400
20	14,600	32,900	162,600	42,200	12,100	16,460	25,190	13,300	6,550	23,480	12,500	97,600
21	14,600	32,900	129,600	37,800	11,310	14,600	27,510	13,300	6,550	22,340	12,100	89,200
22	54,300	36,400	68,400	34,300	11,310	14,600	41,400	12,500	6,020	19,550	11,310	112,000
23	138,400	36,400	60,000	29,430	12,100	14,600	105,200	12,500	5,760	19,010	11,310	183,600
24	82,000	37,800	57,500	28,130	10,560	13,300	103,500	11,310	5,760	16,950	10,560	186,400
25	77,300	38,500	57,500	26,330	10,560	13,300	90,800	11,310	5,760	15,510	10,560	165,300
26	58,400	75,500	46,200	23,480	10,560	13,300	99,200	10,200	10,560	16,950	10,560	107,800
27	53,500	127,800	31,500	22,340	10,560	14,600	105,200	10,200	32,900	16,460	12,500	90,800
28	57,500	132,300	31,500	20,650	10,560	16,950	83,800	9,520	54,300	16,460	13,300	71,000
29	57,500	......	42,200	20,650	10,560	16,950	65,800	8,850	41,400	31,500	15,510	61,700
30	41,400	......	42,200	20,650	10,560	23,480	71,000	7,940	41,400	31,500	16,460	49,400
31	35,000	......	57,500	......	11,310	......	71,000	7,940	......	68,400	16,950	45,400

Mean daily discharge, in second-feet, of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	38,500	165,300	200,600	77,300	28,130	8,190	79,640	25,310	123,500	9,730	21,660	15,450
2	31,500	147,200	276,500	90,800	26,330	8,190	58,820	23,660	94,080	9,730	21,170	14,580
3	34,300	116,400	221,300	95,100	23,480	8,190	46,700	19,210	72,070	9,730	20,190	14,160
4	49,400	119,000	156,300	82,000	19,010	8,190	39,730	16,810	53,750	8,770	18,720	12,560
5	61,700	209,200	120,800	77,300	17,960	8,190	32,510	14,580	46,700	8,770	18,720	12,180
6	66,600	223,200	116,400	64,100	16,460	8,190	36,290	15,450	39,040	8,190	16,810	11,440
7	74,600	178,900	97,600	64,100	16,460	8,190	39,730	19,210	31,300	7,610	16,350	11,440
8	65,800	126,900	106,000	64,100	15,510	8,190	49,450	41,110	23,660	10,410	15,450	11,440
9	51,900	107,800	103,500	64,100	14,600	9,080	49,450	39,730	27,090	16,810	15,450	14,160
10	41,400	86,500	149,000	83,800	14,600	13,340	35,600	32,510	29,500	44,630	14,580	12,560
11	28,130	68,400	183,600	86,500	14,600	13,340	29,500	27,090	25,310	128,900	14,580	10,750
12	22,340	71,000	163,500	83,800	14,600	13,340	21,660	25,310	25,310	138,300	14,580	10,750
13	19,550	77,300	172,600	77,300	14,160	21,660	22,640	25,310	25,310	136,000	14,580	10,750
14	15,510	80,100	153,500	77,300	14,160	27,090	22,640	25,310	23,660	107,700	14,160	11,440
15	15,510	95,100	134,000	118,200	14,160	32,510	17,760	20,190	25,310	79,640	14,160	5,630
16	19,550	97,600	109,400	186,400	14,160	35,600	17,760	21,660	21,660	57,280	14,160	5,630
17	23,480	97,600	101,000	188,400	14,160	36,290	16,350	25,310	18,720	46,700	14,160	5,630
18	25,190	86,500	89,200	149,900	12,100	34,310	14,160	23,660	18,720	42,480	15,450	7,340
19	25,190	68,400	77,300	126,900	12,100	29,500	21,170	21,660	21,660	49,450	98,560	21,660
20	25,190	55,900	77,300	103,500	11,310	24,190	37,670	18,720	23,660	66,480	92,710	31,300
21	25,190	37,800	60,000	77,300	11,310	23,660	53,750	16,350	20,190	68,110	66,480	53,750
22	26,330	43,800	62,500	74,600	10,560	23,660	50,220	15,450	18.720	61,060	61,060	53,060
23	38,500	43,800	68,400	65,800	10,560	27,090	35,600	14,160	16,810	51,600	39,730	53,060
24	36,400	41,400	127,800	62,500	10,560	35,600	30,100	14,580	15,450	42,480	35,600	39,040
25	35,000	38,500	234,300	55,900	10,560	53,060	26,490	14,160	14,580	36,290	31,300	36,290
26	29,430	37,800	214,800	45,400	10,560	66,480	21,660	12,560	14,160	27,090	28,290	31,300
27	29,430	45,400	156,300	43,800	10,560	76,710	20,190	12,560	12,560	28,290	23,660	25,310
28	30,800	43,800	131,400	36,400	10,560	66,480	20,190	13,340	12,180	27,090	15,450	21,170
29	32,900	------	106,000	29,430	10,200	58,820	18,720	33,110	10,410	25,310	15,450	19,210
30	46,200	------	83,800	29,430	10,200	51,600	20,190	57,280	10,410	23,660	15,450	16,810
31	105,200	------	83,800	------	9,520	------	23,660	107,670	------	21,660	------	12,180
1904.												
1	(a)	(a)	(a)	75,500	97,600	31,500	12,500	10,060	9,048	11,540	13,980	11,620
2	(a)	(a)	(a)	141,000	80,100	35,000	11,160	10,780	8,120	10,780	13,140	9,792
3	(a)	(a)	(a)	194,200	75,500	39,600	13,140	12,740	7,824	9,724	12,340	9,114
4	(a)	(a)	(a)	159,000	62,500	39,600	12,500	12,740	7,824	11,540	11,540	7,882
5	(a)	(a)	(a)	127,800	50,200	36,120	10,560	12,340	7,538	12,740	10,780	8,180
6	(a)	(a)	(a)	98,900	37,200	50,200	11,160	11,540	7,258	11,160	10,490	6,228
7	(a)	(a)	(a)	81,600	36,120	55,600	11,160	13,980	6,982	10,060	10,200	8,180
8	(a)	(a)	(a)	71,000	33,740	47,500	15,330	13,550	6,442	9,384	9,792	7,036
9	(a)	(a)	(a)	69,400	29,170	36,120	18,590	11,540	6,442	8,726	9,792	7,882
10	(a)	(a)	(a)	75,500	28,130	30,250	18,590	10,780	7,538	7,824	9,452	7,594
11	(a)	(a)	(a)	111,600	25,190	40,800	43,480	12,340	7,538	7,538	10,130	5,708
12	(a)	(a)	(a)	123,400	23,250	58,400	52,900	10,420	7,538	7,824	9,792	6,228
13	(a)	(a)	(a)	103,200	22,340	46,200	42,200	10,060	7,258	7,824	10,130	10,860
14	(a)	(a)	(a)	89,200	18,590	35,000	32,620	9,384	6,982	7,824	10,860	9,114
15	(a)	(a)	(a)	73,900	21,320	26,100	26,100	8,420	8,726	8,726	10,490	9,452
16	(a)	(a)	(a)	55,900	25,190	22,340	22,340	8,420	10,060	22,680	10,130	8,788
17	(a)	(a)	(a)	54,300	28,130	19,550	18,590	8,120	13,140	20,440	9,792	8,240
18	(a)	(a)	(a)	52,900	31,500	21,320	15,790	7,824	14,870	16,750	9,452	9,520
19	(a)	(a)	(a)	44,800	36,120	21,320	13,980	7,258	11,540	14,420	10,130	9,520
20	(a)	(a)	(a)	43,500	51,540	18,590	13,140	7,538	11,540	12,340	10,130	9,520
21	(a)	(a)	(a)	35,000	69,400	18,590	13,550	8,120	10,420	11,160	9,452	8,850
22	(a)	(a)	(a)	27,030	78,400	19,550	12,340	7,538	9,048	12,340	9,792	8,850
23	(a)	(a)	(a)	32,620	56,900	18,590	12,740	8,120	8,420	22,680	10,130	9,520
24	(a)	(a)	(a)	30,250	44,800	18,590	23,250	8,120	7,538	33,040	10,860	10,200
25	(a)	(a)	(a)	28,130	39,600	20,440	14,420	8,120	7,538	37,240	10,860	10,200
26	(a)	(a)	(a)	29,170	33,740	17,760	11,940	10,780	6,982	30,520	11,620	10,200
27	(a)	(a)	(a)	29,170	36,120	16,080	11,160	16,270	6,712	23,820	12,420	11,700
28	(a)	(a)	(a)	32,620	35,000	13,820	10,780	13,980	7,258	19,880	12,020	12,500
29	(a)	(a)	(a)	50,200	31,500	13,140	11,540	11,940	10,420	18,270	11,230	14,160
30	(a)	(a)	(a)	86,100	27,030	11,780	10,780	10,420	11,160	17,760	12,020	[b]51,120
31	(a)	(a)	(a)	------	28,130	------	10,420	9,724	------	15,790	------	[b]44,120

[a] The ice gorges during January, February, and March make it impossible to estimate daily flow.
[b] Discharge for December 30 and 31 reduced to 40 per cent on account of ice gorge.

Estimated monthly discharge of Susquehanna River at Harrisburg, Pa., 1891–1904.

[Drainage area, 24,030 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1891.					
January	135,800	21,770	72,224	3.006	3.466
February	334,500	61,700	140,746	5.857	6.099
March	156,300	46,200	97,361	4.052	4.672
April	120,800	34,300	79,830	3.322	3.706
May	30,800	13,300	19,193	.799	.921
June	71,000	12,500	25,397	1.057	1.179
July	41,400	12,100	21,708	.903	1.041
August	79,200	13,300	30,568	1.272	1.467
September	46,200	11,310	23,711	.987	1.101
October	46,200	10,200	18,596	.774	.892
November	75,500	13,300	34,115	1.419	1.583
December	129,600	29,430	62,988	2.621	3.022
The year	334,500	10,200	52,201	2.172	29.149
1892.					
January	195,800	14,160	78,944	3.285	3.787
February	49,400	10,560	22,350	.930	1.003
March	193,000	17,960	51,301	2.135	2.461
April	224,200	25,190	79,705	3.317	3.701
May	118,200	21,770	67,255	2.799	3.227
June	183,600	26,330	65,242	2.715	3.029
July	46,200	8,850	19,324	.804	.927
August	38,500	12,100	18,664	.777	.896
September	22,340	7,090	11,219	.467	.521
October	8,850	4,070	5,999	.250	.288
November	30,800	4,070	10,896	.453	.505
December	39,900	6,020	16,153	.672	.775
The year	224,200	4,070	37,254	1.550	21.120

Estimated monthly discharge of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1893.					
January	21,770	13,300	15,515	0.646	0.745
February	167,100	19,550	55,585	2.313	2.409
March	223,200	17,960	93,257	3.881	4.474
April	154,400	54,300	103,387	4.302	4.800
May	267,400	31,500	91,090	3.791	4.371
June	31,500	10,200	18,627	.775	.865
July	16,460	6,020	10,224	.425	.490
August	24,620	3,500	5,680	.236	.272
September	42,200	9,520	18,785	.782	.872
October	57,500	7,940	18,638	.776	.895
November	31,500	10,200	15,425	.642	.716
December	118,200	13,300	40,382	1.681	1.938
The year	267,400	3,500	40,549	1.688	22.847
1894.					
January	55,900	16,950	27,018	1.124	1.296
February	68,400	13,300	31,545	1.313	1.367
March	177,100	25,190	69,791	2.904	3.348
April	136,600	20,650	65,407	2.722	3.037
May	543,500	16,460	94,621	3.938	4.540
June	132,300	16,950	49,839	2.074	2.314
July	19,010	6,550	10,050	.418	.482
August	10,560	3,680	6,626	.276	.318
September	62,500	3,500	17,281	.719	.802
October	61,700	7,940	25,888	1.077	1.242
November	97,600	17,960	46,345	1.929	2.152
December	74,600	16,460	35,195	1.465	1.689
The year	543,500	3,500	39,967	1.663	22.587

Estimated monthly discharge of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1895.					
January	112,000	23,480	50,123	2.086	2.405
February	86,500	21,770	53,531	2.228	2.320
March	147,200	51,900	79,655	3.315	3.822
April	205,400	29,430	84,858	3.531	3.940
May	41,400	15,510	25,048	1.042	1.201
June	29,430	5,240	10,868	.452	.504
July	22,340	3,680	9,370	.390	.450
August	8,540	3,500	5,263	.219	.252
September	10,200	3,680	5,211	.217	.242
October	4,500	2,570	3,306	.138	.159
November	21,770	3,000	6,108	.254	.283
December	62,500	5,240	18,594	.774	.892
The year	205,400	2,570	29,328	1.220	16.470
1896.					
January	136,600	23,480	52,586	2.188	2.523
February	183,600	16,460	52,478	2.184	2.355
March	183,600	16,460	64,346	2.678	3.087
April	223,200	26,330	88,502	3.683	4.109
May	23,480	7,370	12,637	.526	.606
June	47,800	8,850	19,216	.800	.893
July	41,400	10,200	15,195	.632	.729
August	46,200	3,500	14,499	.603	.695
September	7,370	3,160	4,153	.173	.193
October	129,600	9,520	34,463	1.434	1.653
November	140,100	12,100	35,476	1.476	1.647
December	39,900	8,540	21,577	.898	1.035
The year	223,200	3,160	34,594	1.439	19.525

Estimated monthly discharge of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1897.					
January	31,500	9,520	18,609	0.774	0.892
February	101,800	23,480	46,302	1.927	2.007
March	165,300	26,330	88,240	3.672	4.233
April	129,600	25,190	55,768	2.321	2.590
May	101,800	24,620	53,844	2.241	2.584
June	29,430	9,520	17,648	.734	.819
July	43,800	6,550	11,374	.473	.545
August	41,400	7,370	15,208	.633	.730
September	15,510	4,070	6,749	.281	.314
October	11,310	4,070	5,906	.246	.284
November	50,200	4,740	21,592	.899	1.003
December	106,000	17,960	46,585	1.939	2.235
The year	165,300	4,070	32,319	1.345	18.246
1898.					
January	147,200	12,500	58,490	2.434	2.806
February	106,000	19,550	52,376	2.199	2.290
March	245,900	27,510	88,570	3.686	4.250
April	144,500	23,480	53,141	2.211	2.467
May	86,500	36,400	59,310	2.468	2.845
June	41,400	10,560	19,979	.831	.927
July	14,600	4,740	7,998	.333	.384
August	57,500	8,850	26,014	1.083	1.249
September	23,480	5,240	11,238	.468	.522
October	109,400	4,740	32,904	1.369	1.578
November	116,400	17,960	41,096	1.710	1.908
December	101,000	12,500	34,733	1.445	1.666
The year	245,900	4,740	40,487	1.686	22.892

Estimated monthly discharge of Susquehanna River at Harrisburg, Pa., 1891-1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1899.					
January	103,500	20,650	44,427	1.849	2.132
February	120,800	12,500	46,106	1.919	1.998
March	193,000	41,400	100,920	4.200	4.842
April	116,400	29,430	66,984	2.788	3.111
May	54,300	17,960	25,349	1.055	1.216
June	19,010	6,550	11,511	.479	.534
July	11,310	5,240	7,820	.325	.375
August	36,400	3,680	7,297	.304	.350
September	12,100	4,500	6,432	.268	.299
October	7,090	2,850	4,130	.172	.198
November	43,800	4,070	18,795	.782	.872
December	82,000	9,520	32,169	1.340	1.545
The year	193,000	2,850	30,995	1.290	17.472
1900.					
January	174,500	10,560	57,040	2.374	2.737
February	159,000	12,100	63,816	2.656	2.766
March	194,900	23,480	67,494	2.809	3.238
April	92,600	36,400	58,223	2.423	2.703
May	36,400	12,500	19,250	.801	.923
June	19,550	7,370	13,112	.546	.609
July	9,520	5,240	7,134	.297	.342
August	9,520	2,850	5,066	.211	.243
September	7,370	2,330	3,721	.155	.173
October	7,940	2,570	4,314	.180	.208
November	194,000	4,070	23,489	.977	1.091
December	93,400	13,300	36,726	1.528	1.762
The year	194,900	2,330	29,949	1.246	16.595

Estimated monthly discharge of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1901.					
January	29,430	7,370	14,038	0.584	0.673
February	36,400	11,310	20,038	.834	.868
March	191,100	10,560	81,035	3.372	3.888
April	204,400	47,800	103,963	4.326	4.827
May	210,100	28,130	63,972	2.662	3.069
June	185,500	25,190	55,083	2.292	2.557
July	24,620	9,520	13,518	.563	.649
August	120,800	7,940	33,266	1.384	1.596
September	54,300	10,560	22,089	.919	1.025
October	19,550	8,850	13,150	.547	.631
November	58,400	6,550	14,849	.618	.689
December	405,100	14,600	73,514	3.059	3.527
The year	405,100	6,550	42,376	1.738	23.999
1902.					
January	138,400	13,300	37,012	1.540	1.775
February	132,300	13,300	47,168	1.963	2.044
March	484,100	31,500	155,396	6.467	7.456
April	224,200	20,650	68,132	2.835	3.163
May	21,770	10,560	15,401	.641	.739
June	23,480	7,940	12,810	.533	.595
July	112,000	25,190	70,209	2.922	3.369
August	72,800	7,940	26,962	1.122	1.294
September	54,300	5,760	11,714	.488	.544
October	68,400	15,510	35,656	1.484	1.711
November	60,000	10,560	20,985	.873	.974
December	186,400	16,950	63,774	2.654	3.060
The year	484,100	5,760	47,102	1.960	26.724

Estimated monthly discharge of Susquehanna River at Harrisburg, Pa., 1891–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1903.					
January	105,200	15,510	37,765	1.572	1.812
February	223,200	37,800	93,236	3.880	4.040
March	276,500	60,000	133,500	5.556	6.405
April	188,400	29,430	82,715	3.442	3.840
May	28,130	9,520	14,297	.595	.686
June	76,710	8,190	27,964	1.163	1.298
July	79,640	14,160	32,581	1.355	1.560
August	107,670	12,560	25,581	1.064	1.227
September	123,500	10,410	30,511	1.270	1.417
October	138,300	7,610	45,160	1.880	2.167
November	98,560	14,160	27,289	1.135	1.266
December	53,750	5,630	19,743	.822	.948
The year	276,500	5,630	47,528	1.978	26.666
1904.					
January [a]			30,410	1.27	1.47
February [a]			38,590	1.61	1.74
March [a]			102,000	4.24	4.89
April	194,200	27,030	74,230	3.09	3.45
May	97,600	18,590	41,740	1.74	2.01
June	58,400	11,780	29,320	1.22	1.36
July	52,900	10,420	18,020	.750	.865
August	16,270	7,258	10,420	.434	.500
September	14,870	6,442	8,657	.360	.402
October	37,240	7,538	15,240	.634	.731
November	13,980	9,452	10,760	.448	.500
December	51,120	5,708	8,448	.352	.405
The year			32,320	1.35	18.32

[a] Owing to an ice gorge below Harrisburg the monthly mean for January, February, and March has been estimated by taking 89 per cent of means for McCalls Ferry. Practically open conditions existed at the latter station (see p. 183).

SUSQUEHANNA RIVER AT McCALLS FERRY, PA.

The McCalls Ferry gaging station is located, as shown in Pl. VIII, at a narrow and rocky part of Susquehanna River, about 20 miles above its mouth and 1 mile above the village of that name. It was established on May 17, 1902, by Boyd Ehle while investigating a power development there. For a considerable distance along this portion of the river the bank on the York County shore is the retaining wall of an abandoned canal which can be overtopped only in the greatest floods. The Lancaster shore, on the opposite side, is made up of almost vertical rock, and the railroad which skirts it has never yet been flooded at this point.

The gaging section first selected for the station is located at Duncans Run (A-A, Pl. VIII), where two islands, Hartman and Streepers, divide the river into three channels, ranging in width from 100 to 500 feet. At ordinary low water, however, two of these run dry, thus confining the discharge to the main or westernmost channel. The river bed at the section is composed of schistose rock, with some projecting bowlders and large irregularities. The flow, however, is comparatively free from the boils so common in a river of this character.

The discharge measurements are made from a boat held in place by a rope stretched between the towpath and Streepers Island, the gaging points, 10 feet apart, being indicated by a tagged wire, which is also used for keeping the boat parallel to the current.

In order to provide for measuring the large floods which occur in the winter and spring months a cable station was established by Mr. Ehle in the fall of 1902, about 1,000 feet downstream from the Duncans Run section (B-B, Pl. VIII). The banks of the river and the condition of the river bed are very similar to those at the upper section, though the latter is somewhat more irregular, as shown by Pl. I, *B*. During the low-water period of the fall of 1902 a careful survey was made of the section at the cable station, and a contour map with 1-foot intervals was prepared from which the effective areas could be accurately determined, thus eliminating the error in discharge due to possible inaccuracies in soundings made at the time of the measurements. The width of the stream at this point is about 1,300 feet, and the maximum depth during a gaging was 46 feet.

The car cable, a $\frac{3}{4}$-inch 37-wire strand, with a span of 1,450 feet, is anchored to 3-inch eyebolts set in cement in the solid rock on either side of the river. A 2-inch turn-buckle is provided at the York County end to regulate its height above the water. A high cliff on one shore and a large red oak on the other give the cable a 10-foot clearance over the highest floods on record. The car which runs on the cable, as shown in Pl. IX, *B*, accommodates two people, and is propelled by a crank turning one of the sheaves.

VIEW OF SUSQUEHANNA RIVER ABOVE McCALLS FERRY.

A A, Duncans Run gaging station; B B, cable gaging station.

Eighty feet upstream from the main cable is suspended a ⅝-inch secondary cable, along which runs a trolley carrying a guy rope to hold the meter against the current (Pl. IX, *A*). Measuring points for this section are 50 feet apart and are indicated by red and white bands painted on the main cable, the intermediate distances being readily estimated by counting the revolutions of the sheave.

The measurements at both of the above stations are referred to two permanent gages, designated Nos. 2 and 5. These are painted on the rock and give elevations directly above sea level. Gage No. 2 is located about three-fourths of a mile below the village of McCalls Ferry in the tailrace of the proposed power house and has been read daily since June, 1902. The records in the following tables have been referred to this gage. Gage No. 5 is placed about 2 miles below McCalls Ferry, at the foot of Cullys Falls, and was thus located in order to be entirely out of the influence of the proposed dam. One of the purposes of the extensive investigations carried on at McCalls Ferry was to obtain data for determining the coefficient of discharge over ogee-faced weirs under high heads, and it is for use in these investigations that gage No. 5 was established.

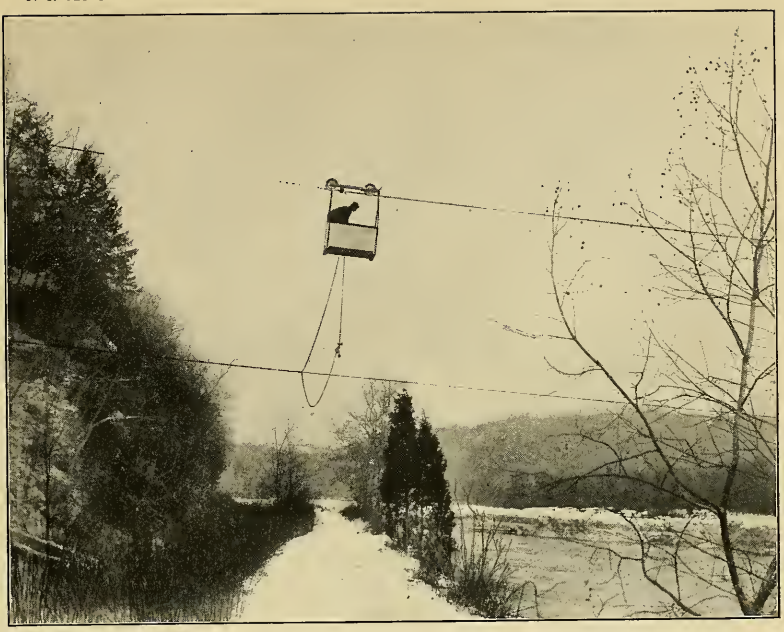
The methods used in carrying on the work at the McCalls Ferry station were practically the same as those employed by the United States Geological Survey. Every effort was made to eliminate any source of error, and vertical velocity determinations were taken whenever possible. At Duncans Run, in order to get satisfactory vertical velocity curves, an 80-pound weight, with pulley and rope attached, was dropped to the bottom, so that the meter could be pulled down without being washed too far from the section. When the surface velocity or 0.6 method was used the results were reduced by coefficients determined from these vertical velocity curves. At the cable station the secondary cable with the aid of the guy rope made it possible to get vertical velocity measurements at exceptionally great velocities and depths. A No. 12 telegraph wire was found to be more satisfactory at such times for holding the meter than the insulated cable ordinarily used, as it offered less resistance to the current, would allow the meter to sink deeper, and being less bowed by the water would show more accurately its depth below the surface. In this way curves were obtained to depths of 20 feet and in currents of 10 feet per second.

During the highest stages, when the velocity sometimes reaches 17 feet per second, readings could only be taken at the surface. These results were, however, reduced by coefficients determined from the vertical velocity curves for each measuring point.

Discharge measurements of Susquehanna River at Duncans Run station above McCalls Ferry, Pa., 1902–1904.

Date.	Hydrographer.	Gage height.[a]	Area of section.	Mean velocity.	Discharge.
		Feet.	*Square feet.*	*Feet per second.*	*Second-feet.*
1902.					
May 17	Boyd Ehle	116.62	4,570	3.70	16,880
24	....do	115.83	4,340	2.93	12,710
June 9	....do	115.30	3,990	2.59	10,330
23	....do	116.32	4,564	3.17	14,440
July 14	....do	121.90	9,180	6.00	55,100
16	....do	120.12	7,400	5.15	38,100
21	....do	117.90	6,020	4.02	24,200
24	....do	125.10	11,900	8.01	95,300
26	....do	123.82	11,000	7.41	81,500
Sept. 3	....do	114.82	3,800	2.14	8,130
25	....do	114.34	3,500	1.82	6,370
1903.					
June 5	R. H. Anderson	115.17	3,850	2.60	10,000
1904.					
Sept. 29	W. G. Steward	114.75	3,717	216	7,940

[a] At gage No. 2.



A

B

GAGING CAR AT McCALLS FERRY CABLE STATION.

A, Gaging car in operation; *B*, gaging car.

Discharge measurements of Susquehanna River at cable station above McCalls Ferry, Pa., 1903–1904.

Date.	Hydrographer.	Gage height.[a]	Area of section.	Mean velocity.	Discharge.
1903.		*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
Feb. 10	R. H. Anderson	123.90	14,300	5.97	[b] 85,400
Mar. 2	do	135.90	33,800	8.59	[b] 290,550
3	do	133.60	30,365	8.23	[b] 250,000
4	do	130.00	23,050	7.55	[b] 174,060
5	do	127.20	19,000	6.80	[b] 129,300
6	do	125.20	16,175	6.41	[c] 104,600
7	do	124.20	14,780	5.77	[c] 85,300
12	do	129.40	22,460	7.16	[c] 160,600
18	do	123.40	13,220	5.84	[c] 77,240
25	do	134.30	31,220	8.75	[b] 273,300
27	do	130.10	23,720	7.38	[b] 175,210
28	do	127.60	19,780	6.90	[b] 136,400
Apr. 3	do	123.80	14,060	5.72	[b] 80,400
9	do	123.30	13,310	5.75	[c] 76,600
16	do	131.50	26,445	7.91	[b] 209,200
18	do	128.80	21,350	7.15	[b] 152,500
22	do	122.60	11,840	5.62	[b] 66,600
25	do	120.70	9,400	4.96	[c] 46,660
May 4	do	117.85	5,870	4.16	[c] 24,400
14	do	116.50	4,410	3.63	[c] 16,000
23	do	115.72	4,120	3.19	[c] 13,140
June 5	do	115.17	2,885	3.40	[c] 9,810
17	do	120.00	8,180	4.67	[c] 38,200
1904.					
Mar. 8	R. H. Anderson	146.6	54,500	11.6	[d] 631,000
May 11	do	119.00	7,035	4.7	[b] 34,400

[a] At gage No. 2.
[b] Surface velocities.
[c] Multiple points.
[d] See page 177.

Mean daily gage height, in feet, of Susquehanna River at McCalls Ferry, Pa., for 1902–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.												
1	-------	-------	-------	-------	-------	116.15	117.50	122.10	114.90	120.50	122.10	117.15
2	-------	-------	-------	-------	-------	116.15	-------	121.70	114.90	122.60	121.30	117.40
3	-------	-------	-------	-------	-------	115.80	123.70	121.50	114.80	122.70	120.10	118.45
4	-------	-------	-------	-------	-------	115.80	123.10	122.20	114.85	122.10	119.60	119.25
5	-------	-------	-------	-------	-------	115.80	123.15	122.00	114.80	121.50	119.00	119.60
6	-------	-------	-------	-------	-------	115.35	124.30	121.20	114.60	121.40	118.50	119.40
7	-------	-------	-------	-------	-------	115.25	123.55	120.60	114.55	121.30	118.20	119.40
8	-------	-------	-------	-------	-------	115.20	123.55	119.40	114.50	120.90	118.00	119.10
9	-------	-------	-------	-------	-------	115.20	125.50	118.85	114.60	120.00	117.80	119.10
10	-------	-------	-------	-------	-------	115.50	124.50	118.50	114.65	119.50	117.55	-------
11	-------	-------	-------	-------	-------	115.65	122.90	118.90	114.55	118.80	117.40	-------
12	-------	-------	-------	-------	-------	115.60	122.10	119.00	114.65	119.20	117.10	118.10
13	-------	-------	-------	-------	-------	115.60	122.50	118.70	114.80	121.40	117.00	119.50
14	-------	-------	-------	-------	-------	115.70	121.85	118.10	114.75	121.00	116.90	120.10
15	-------	-------	-------	-------	-------	116.20	120.80	117.75	114 75	120.50	116.70	119.30
16	-------	-------	-------	-------	-------	116.20	120.20	117.50	114.70	119.60	116.60	119.40
17	-------	-------	-------	-------	-------	116.35	119.30	117.20	114.65	119.00	116.50	123.00
18	-------	-------	-------	-------	-------	116.80	118.65	116.95	114.65	-------	116.40	126.35
19	-------	-------	-------	-------	-------	116.45	118.20	116.70	114.55	118.70	116.35	125.85
20	-------	-------	-------	-------	-------	116.65	117.80	116.30	114.50	118.20	116.30	125.00
21	-------	-------	-------	-------	-------	116.60	117.90	116.20	114.40	117.80	116.20	124.50
22	-------	-------	-------	-------	-------	116.35	117.30	116.00	114.50	117.50	116.10	127.65
23	-------	-------	-------	-------	-------	116.30	122.85	115.80	114.40	117.20	116.00	131.50
24	-------	-------	-------	-------	-------	116.15	-------	115.75	114.30	116.90	115.95	131.50
25	-------	-------	-------	-------	-------	115.95	124.05	115.75	114.35	117.00	116.00	129.95
26	-------	-------	-------	-------	-------	116.15	123.85	115.70	114.60	117.00	116.20	126.55
27	-------	-------	-------	-------	-------	116.40	124.70	115.55	118.55	116.90	116.85	124.30
28	-------	-------	-------	-------	-------	116.65	123.85	115.40	121.00	117.10	-------	122.90
29	-------	-------	-------	-------	-------	116.75	122.20	115.30	120.00	118.70	117.15	122.30
30	-------	-------	-------	-------	-------	116.95	121.90	115.20	119.85	122.00	117.15	121.00
31	-------	-------	-------	-------	-------	-------	122.60	115.00	-------	-------	-------	120.60
1903.												
1	120.10	131.00	132.80	123.10	118.60	115.55	123.00	118.00	127.00	115.75	117.80	117.00
2	119.50	129.20	136.00	123.40	118.20	115.50	122.30	117.70	124.80	115.75	117.75	116.80
3	121.30	126.80	133.60	123.80	118.00	115.40	119.90	117.50	123.20	115.50	117.60	116.60
4	122.10	126.50	129.90	123.40	117.80	115.30	119.40	117.20	122.00	115.40	117.50	116.30
5	122.70	131.50	127.00	122.60	117.75	115.20	120.10	117.10	121.00	115.40	117.40	116.80
6	122.90	133.10	125.20	122.10	117.60	115.10	120.00	117.10	120.00	115.40	117.25	116.80
7	123.10	131.20	124.20	122.10	117.50	115.10	119.80	118.00	119.50	115.50	117.10	116.80
8	122.30	128.70	124.30	122.30	117.30	115.50	121.60	119.70	119.00	116.10	116.95	116.60
9	121.10	125.60	124.70	123.10	117.10	115.65	120.80	119.90	118.70	116.70	117.00	116.50
10	(a)	124.00	127.10	123.80	117.00	116.20	120.00	119.60	118.75	120.80	117.00	116.60
11	-------	122.90	131.00	124.00	116.90	116.90	119.00	119.00	118.75	127.80	117.05	116.30
12	-------	122.80	129.70	123.50	116.60	117.45	118.70	118.60	118.50	129.20	117.00	116.00
13	-------	123.00	-------	123.00	116.55	117.50	118.85	118.10	118.75	128.50	116.85	116.60
14	(b)	123.30	129.40	123.00	116.50	118.30	118.50	118.00	118.60	126.40	116.60	116.00
15	-------	123.60	127.50	-------	116.25	119.60	118.00	117.65	118.55	123.80	116.50	115.50
16	-------	124.50	125.30	-------	116.20	119.50	117.50	117.90	118.00	122.00	116.40	115.30
17	118.40	124.90	124.20	131.70	116.15	120.00	117.20	117.90	117.95	120.90	116.70	115.00
18	118.70	124.50	123.30	129.50	116.05	119.70	117.15	118.00	118.00	120.80	116.80	114.70
19	119.00	-------	122.70	126.60	115.95	119.15	119.50	117.70	118.05	121.10	125.60	115.00
20	-------	120.30	122.00	124.80	115.95	118.75	120.60	117.40	118.50	122.50	125.00	116.00
21	119.50	119.30	121.70	123.60	115.95	118.65	121.80	117.10	118.00	123.10	123.10	118.50
22	119.80	119.10	121.80	122.60	115.85	118.40	120.60	116.80	117.60	122.30	121.60	118.60
23	120.00	118.70	122.60	121.80	115.75	118.10	120.00	116.60	117.40	121.30	120.40	119.70
24	120.10	119.50	126.80	121.10	115.85	118.50	119.50	117.00	117.10	120.50	119.70	120.50
25	119.60	120.60	134.10	120.50	115.85	-------	118.95	117.30	116.90	119.80	119.20	119.70
26	119.30	120.40	132.80	120.10	115.85	121.80	118.10	116.95	116.60	119.60	118.80	119.40
27	119.20	120.50	129.80	119.80	115.80	123.60	117.85	116.70	116.30	119.00	118.50	118.40
28	119.50	122.30	127.00	119.50	115.80	123.00	118.20	117.80	116.20	118.70	118.20	117.70
29	120.40	-------	125.20	119.10	-------	122.30	117.80	121.30	116.00	118.40	117.70	117.50
30	121.10	-------	123.90	-------	115.70	122.40	117.50	122.40	115.90	118.10	117.30	117.40
31	122.70	-------	123.50	-------	115.60	-------	118.00	124.20	-------	118.00	-------	116.90

a Slush ice filled in above gage.
b River frozen over at neck and foot of Gullys Falls.

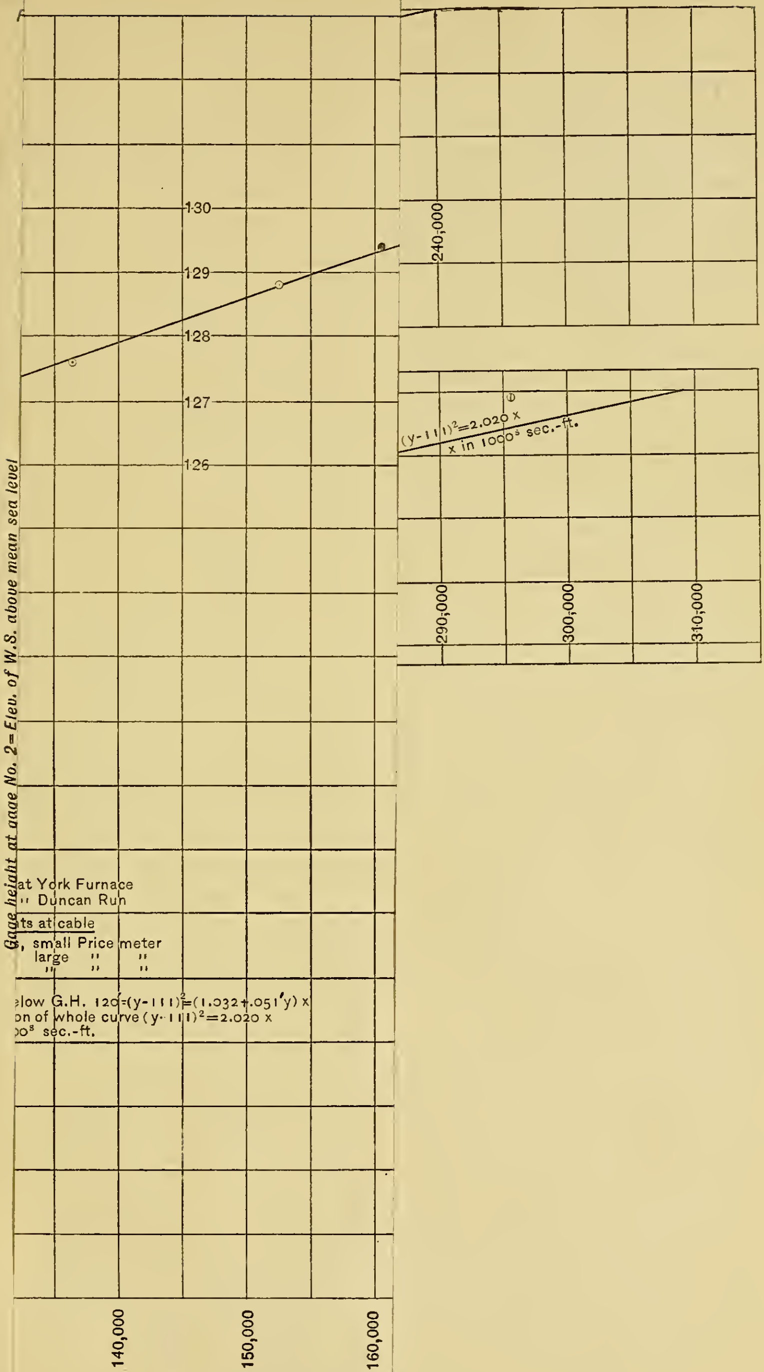
Mean daily gage height, in feet, of Susquehanna River at McCalls Ferry, Pa., for 1902–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
1	116.6	120.0	120.0	123.9	125.2	119.4	116.8	115.8	115.5	116.2	117.1	116.0
2	116.3	119.0	121.0	129.2	124.4	119.3	116.5	115.7	115.3	116.1	116.9	115.9
3	115.9	118.5	122.0	132.6	123.3	119.9	116.3	116.0	115.1	116.0	116.8	115.8
4	[a]115.8	117.9	122.9	130.0	122.5	120.4	116.0	116.6	115.5	115.8	116.5	115.5
5	116.0	117.3	128.0	127.0	121.5	120.2	116.0	116.6	115.3	115.9	116.3	115.3
6	116.5	117.0	128.0	125.0	120.9	120.8	116.0	116.4	115.1	115.6	116.2	115.3
7	116.9	118.5	126.4	123.9	120.0	122.3	116.2	116.6	115.0	115.8	115.9	115.1
8	115.8	119.4	[b]146.6	123.1	119.8	121.4	116.5	116.7	114.9	115.7	115.7	115.0
9	115.5	121.5	130.2	123.2	119.5	120.1	117.0	116.7	114.8	115.6	115.5	114.8
10	115.5	125.0	130.4	123.4	119.3	119.9	117.5	117.0	114.7	115.4	115.7	114.7
11	116.0	125.7	130.9	124.6	119.0	119.6	119.9	117.5	114.7	115.3	115.5	114.5
12	116.8	124.3	126.6	127.3	118.6	121.7	121.0	117.0	114.8	115.4	115.5	114.4
13	117.1	122.7	124.9	125.9	118.3	121.0	121.1	116.4	115.0	115.4	115.6	114.2
14	117.3	121.9	123.6	124.4	118.3	119.9	119.9	116.0	115.3	115.4	115.9	114.2
15	117.3	121.0	122.3	123.6	118.2	119.3	119.0	115.7	115.8	115.4	116.0	114.4
16	117.4	120.4	121.5	122.6	119.0	118.5	118.5	115.5	116.1	115.4	116.0	115.3
17	117.0	119.5	121.1	121.9	119.5	118.3	118.7	115.3	116.4	118.2	115.9	114.6
18	116.6	118.6	120.7	121.6	119.7	118.0	117.4	115.2	117.0	118.0	115.8	114.6
19	116.4	118.0	120.9	121.0	120.3	118.0	117.0	115.2	116.8	117.5	115.7	114.6
20	116.0	117.8	121.0	120.6	121.3	117.9	116.8	115.3	116.5	116.8	115.7	114.5
21	116.0	118.0	121.6	120.2	122.7	117.8	116.6	115.7	116.3	117.0	115.7	114.6
22	117.4	120.0	122.6	120.1	123.8	117.2	116.5	115.6	116.0	117.3	115.6	114.5
23	122.3	120.9	123.0	119.9	122.8	118.0	116.4	115.5	115.8	117.5	115.5	114.5
24	[c]120.7	120.1	123.9	119.5	121.0	117.9	.16.4	115.4	115.6	118.7	115.7	114.8
25	129.3	120.7	128.3	119.3	120.6	118.0	117.8	115.3	115.2	119.7	115.7	115.0
26	126.8	120.7	130.0	119.2	119.9	117.8	117.4	115.4	114.9	120.0	115.8	114.9
27	124.0	120.3	131.6	119.3	120.2	117.3	116.5	115.7	114.8	119.3	116.0	115.0
28	123.0	119.8	132.9	119.7	119.9	116.9	116.3	116.9	114.6	118.5	116.3	115.1
29	122.3	119.0	130.7	121.0	119.6	116.8	116.0	116.6	114.8	117.9	115.7	115.5
30	121.4	-------	128.9	122.1	119.0	116.7	116.0	116.1	115.8	117.8	116.1	116.2
31	120.5	-------	125.3	-------	119.6	-------	115.9	115.8	-------	117.5	-------	123.0

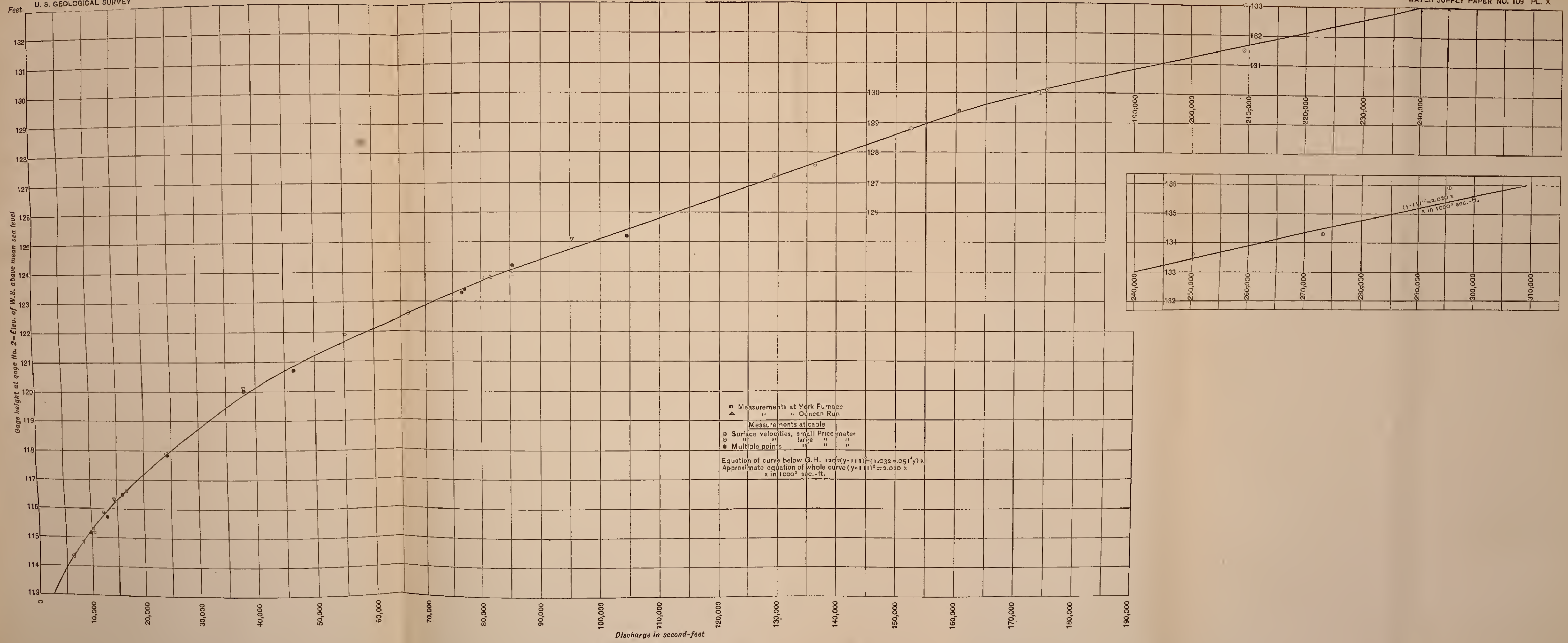
[a] Entire river covered with 14 to 18 inch ice.
[b] Ice moved 2 p.m.
[c] Ice broke and went out of deeps at 5.30 p. m.; 133.8 maximum reading during night, 24th and 25th.

Rating table for Susquehanna River at McCalls Ferry, Pa., for 1902 to 1904.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
114.0	5,160	116.4	15,610	120.6	44,200	126.0	112,900
114.1	5,500	116.5	16,150	120.8	46,100	126.5	119,900
114.2	5,840	116.6	16,690	121.0	48,000	127.0	127,000
114.3	6,200	116.7	17,240	121.2	50,000	127.5	134,100
114.4	6,560	116.8	17,800	121.4	52,100	128.0	141,100
114.5	6,930	116.9	18,360	121.6	54,300	128.5	148,300
114.6	7.310	117.0	18,930	121.8	56,600	129.0	155,300
114.7	7,700	117.2	20,120	122.0	59,000	129.5	163,400
114.8	8,100	117.4	21,320	122.2	61,500	130.0	172,500
114.9	8,500	117.6	22,560	122.4	64,000	130.5	182,800
115.0	8,920	117.8	23,820	122.6	66,500	131.0	194,100
115.1	9,340	118.0	25,110	122.8	69,000	131.5	205,800
115.2	9,770	118.2	26,430	123.0	71,500	132.0	217,300
115.3	10,210	118.4	27,780	123.2	74,000	132.5	228,600
115.4	10,660	118.6	29,140	123.4	76,400	133.0	240,000
115.5	11,120	118.8	30,500	123.6	78,900	133.5	251,200
115.6	11,580	119.0	31,900	123.8	81,500	134.0	262,000
115.7	12,060	119.2	33,300	124.0	84,200	134.5	273,600
115.8	12,540	119.4	34,700	124.2	87,000	135.0	285,300
115.9	13,040	119.6	36,100	124.4	89,900	135.5	297,200
116.0	13,540	119.8	37,500	124.6	92,800	136.0	309,300
116.1	14,040	120.0	39,100	124.8	95,700		
116.2	14,560	120.2	40,700	125.0	98,600		
116.3	15,080	120.4	42,400	125.5	105,900		



RIVER AT McCALLS FERRY, PA.



RATING CURVE FOR SUSQUEHANNA RIVER AT McCALLS FERRY, PA.

Mean daily discharge, in second-feet, of Susquehanna River at McCalls Ferry, Pa., for 1902–1904.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.												
1	------	------	------	------	------	14,300	21,940	60,200	8,510	43,300	60,200	19,830
2	------	------	------	------	------	14,300	[a]50,000	55,400	8,510	66,500	51,100	21,320
3	------	------	------	------	------	12,550	80,200	53,200	8,100	67,700	39,900	28,120
4	------	------	------	------	------	12,550	72,700	61,500	8,300	60,200	36,000	33,500
5	------	------	------	------	------	12,550	73,350	59,000	8,100	53,200	31,900	36,000
6	------	------	------	------	------	10,430	88,500	50,000	7,300	52,100	28,460	34,600
7	------	------	------	------	------	9,990	78,250	44,200	7,120	51,100	26,430	34,600
8	------	------	------	------	------	9,770	78,250	34,600	6,930	47,050	25,110	32,500
9	------	------	------	------	------	9,770	105,900	30,870	7,300	39,100	23,820	32,500
10	------	------	------	------	------	11,120	91,300	28,460	7,500	35,300	22,250	[a]30,000
11	------	------	------	------	------	11,820	70,200	31,210	7,120	30,530	21,320	[a]28,000
12	------	------	------	------	------	11,580	60,200	31,900	7,500	33,200	19,530	25,770
13	------	------	------	------	------	11,580	65,300	29,840	8,100	52,100	18,940	35,300
14	------	------	------	------	------	12,060	57,200	25,770	7,900	48,000	18,360	39,900
15	------	------	------	------	------	14,560	46,100	23,500	7,900	43,300	17,250	33,900
16	------	------	------	------	------	14,560	40,700	21,940	7,700	36,000	16,690	34,600
17	------	------	------	------	------	15,340	33,900	20,120	7,500	31,900	16,150	71,500
18	------	------	------	------	------	17,800	29,500	18,640	7,500	[a]31,000	15,610	117,800
19	------	------	------	------	------	15,880	26,430	17,250	7,120	29,840	15,340	110,800
20	------	------	------	------	------	16,970	23,820	15,080	6,930	26,430	15,080	98,600
21	------	------	------	------	------	16,690	24,460	14,560	6,560	23,820	14,560	91,300
22	------	------	------	------	------	15,340	20,720	13,540	6,930	21,940	14,050	136,200
23	------	------	------	------	------	15,080	69,600	12,550	6,560	20,120	13,540	205,800
24	------	------	------	------	------	14,300	[a]77,000	12,300	6,200	18,360	13,290	205,800
25	------	------	------	------	------	13,290	84,900	12,300	6,380	18,940	13,540	170,600
26	------	------	------	------	------	14,300	82,150	12,060	7,300	18,940	14,560	119,900
27	------	------	------	------	------	15,610	94,300	11,350	28,800	18,360	18,080	88,500
28	------	------	------	------	------	16,970	82,150	10,660	48,000	19,530	[a]19,000	70,200
29	------	------	------	------	------	17,530	61,500	10,210	39,100	29,840	19,830	62,800
30	------	------	------	------	------	18,640	57,800	9,770	37,900	59,000	19,830	48,000
31	------	------	------	------	------	------	66,500	8,920	------	59,000	------	44,200
1903.												
1	39,900	194,100	235,400	72,700	29,150	11,350	71,500	25,110	127,000	12,300	23,820	18,940
2	35,300	158,400	309,300	76,400	26,430	11,120	62,800	23,180	95,700	12,300	23,500	17,800
3	51,000	124,100	253,400	81,500	25,110	10,660	38,300	21,940	74,000	11,120	22,560	16,690
4	60,200	119,900	170,600	76,400	23,820	10,210	34,600	20,120	59,000	10,660	21,940	15,080
5	67,700	205,800	127,000	66,500	23,500	9,770	39,900	19,530	48,000	10,660	21,320	17,800
6	70,200	242,300	101,500	60,200	22,560	9,350	39,100	19,530	39,100	10,660	20,420	17,800
7	72,700	198,800	87,000	60,200	21,940	9,350	37,500	25,110	35,300	11,120	19,530	17,800
8	62,800	151,100	88,500	62,800	20,720	11,120	54,300	36,750	31,900	14,050	18,640	16,690
9	49,000	107,300	94,300	72,700	19,530	11,820	46,100	38,300	29,840	17,250	18,940	16,150
10	[a]46,200	84,200	128,500	81,500	18,940	14,560	39,100	36,000	30,180	46,100	18,940	16,690
11	[a]43,600	70,200	194,100	84,200	18,360	18,360	31,900	31,900	30,180	138,300	19,230	15,080
12	[a]41,000	69,000	167,000	77,600	16,690	21,630	29,840	29,150	28,460	158,400	18,940	13,540
13	[a]38,400	71,500	[a]164,000	71,500	16,420	21,940	30,870	25,770	30,180	148,300	18,080	16,690
14	[a]35,800	75,200	161,700	71,500	16,150	27,100	28,460	25,110	29,150	118,500	16,690	13,540
15	[a]33,200	78,900	134,100	[a]120,000	14,820	36,000	25,110	22,870	28,800	81,500	16,150	11,120
16	[a]30,600	91,300	103,000	[a]200,000	14,560	35,300	21,940	24,460	25,110	59,000	15,610	10,210
17	27,780	97,100	87,000	210,400	14,300	39,100	20,120	24,460	24,780	47,050	17,250	8,920
18	29,840	91,300	75,200	163,400	13,800	36,750	19,830	25,110	25,110	46,100	17,800	7,700
19	31,900	[a]66,000	67,700	121,300	13,290	32,800	35,300	23,180	25,440	49,000	107,300	8,920
20	33,000	41,550	59,000	95,700	13,290	30,180	44,200	21,320	28,460	65,300	98,600	13,540
21	35,300	33,900	55,400	78,900	13,290	29,500	56,600	19,530	25,110	72,700	72,700	28,460
22	37,500	32,500	56,600	66,500	12,800	27,780	44,200	17,800	22,560	62,800	54,300	29,150
23	39,100	29,840	66,500	56,600	12,300	25,770	39,100	16,690	21,320	51,100	42,400	36,750
24	39,900	35,300	124,100	49,000	12,800	28,460	35,300	18,940	19,530	43,300	36,750	43,300
25	36,000	44,200	264,300	43,300	12,800	[a]42,000	31,550	20,720	18,360	37,500	33,200	36,750
26	33,900	42,400	235,400	39,900	12,800	56,600	25,770	18,640	16,690	36,000	30,530	34,600
27	33,200	43,300	168,800	37,500	12,550	78,900	24,140	17,250	15,080	31,900	28,460	27,780
28	35,300	62,800	127,000	35,300	12,550	71,500	26,430	23,820	14,560	29,840	26,430	23,180
29	42,400	------	101,500	32,500	[a]12,300	62,800	23,820	51,100	13,540	27,780	23,180	21,940
30	49,000	------	82,800	[a]31,000	12,060	64,000	21,940	64,000	13,040	25,770	20,720	21,320
31	67,700	------	77,600	------	11,580	------	25,110	87,000	------	25,110	------	18,360

[a] Estimated.

Mean daily discharge, in second-feet, of Susquehanna River at McCalls Ferry, Pa., for 1902–1904—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
1	16,690	39,100	39,100	82,800	101,500	34,700	17,800	12,540	11,120	14,560	19,520	13,540
2	15,080	31,900	48,000	158,400	89,900	34,000	16,150	12,060	10,210	14,040	18,360	13,040
3	13,040	28,460	59,000	230,900	75,200	38,300	15,080	13,540	9,340	13,540	17,800	12,540
4	12,540	24,460	70,200	172,500	65,300	42,400	13,540	16,690	11,120	12,540	16,150	11,120
5	13,540	20,720	141,100	127,000	53,200	40,700	13,540	16,690	10,210	13,040	15,080	10,210
6	16,150	18,930	141,100	98,600	47,050	46,100	13,540	15,610	9,340	11,120	14,560	10,210
7	18,360	28,460	118,500	82,800	39,100	62,800	14,560	16,690	8,920	12,540	13,040	9,340
8	12,540	34,700	a300,000	72,700	37,500	52,100	16,150	17,240	8,500	12,060	12,060	8,920
9	11,120	53,200	176,500	74,000	35,400	39,900	18,930	17,240	8,100	11,120	11,120	8,100
10	11,120	98,600	180,700	76,400	34,000	38,300	21,940	18,930	7,700	10,660	12,060	7,700
11	13,540	108,700	192,000	92,800	31,900	36,100	38,300	21,940	7,700	10,210	11,120	6,930
12	17,800	88,500	121,300	131,300	29,140	55,400	48,000	18,930	8,100	10,660	11,120	6,560
13	19,520	67,700	97,100	111,500	27,100	48,000	49,000	15,610	8,920	10,660	11,580	5,840
14	20,720	57,800	78,900	89,900	27,100	38,300	38,300	13,540	10,210	10,660	13,040	5,840
15	20,720	48,000	62,800	78,900	26,430	34,000	31,900	12,060	12,540	10,210	13,540	6,560
16	21,320	42,400	53,200	66,500	31,900	28,460	28,460	11,120	14,040	10,660	13,540	10,210
17	18,930	35,400	49,000	57,800	35,400	27,100	29,820	10,210	15,610	26,430	13,040	7,310
18	16,690	29,140	45,100	54,300	36,800	25,110	21,320	9,770	18,930	25,100	12,540	7,310
19	15,610	25,110	47,050	48,000	41,550	25,110	18,930	9,770	17,800	21,940	12,660	7,310
20	13,540	23,820	48,000	44,200	51,100	24,460	17,800	10,210	16,150	17,800	12,060	6,930
21	13,540	25,110	54,300	40,700	67,700	23,820	16,690	12,060	15,080	18,930	12,060	7,310
22	21,320	39,100	66,500	39,900	81,500	20,120	16,150	11,580	13,540	20,720	11,580	6,930
23	62,800	47,050	71,500	38,300	69,000	25,110	15,610	11,120	12,540	21,940	11,120	6,930
24	45,100	39,900	82,800	35,400	48,000	24,460	15,610	10,660	11,580	29,820	12,060	8,100
25	160,000	45,100	145,500	34,000	44,200	25,110	23,820	10,210	9,770	36,800	12,060	8,920
26	124,100	45,100	172,500	33,300	38,300	23,820	21,320	10,660	8,500	39,100	12,540	8,500
27	84,200	41,550	208,100	34,000	40,700	20,720	16,150	12,060	8,100	34,000	13,540	8,920
28	71,500	37,500	237,700	36,800	38,300	18,360	15,080	18,360	7,310	28,460	15,080	9,340
29	62,800	31,900	187,200	48,000	36,100	17,800	13,540	16,690	8,100	24,460	12,060	11,120
30	52,100	......	153,900	60,200	31,900	17,240	13,540	14,040	12,540	23,820	14,040	14,560
31	43,300	......	103,000	......	36,100	......	13,040	12,540	......	21,940	......	71,500

a Maximum discharge, 631,000. Mean daily discharge estimated.

Estimated monthly discharge of Susquehanna River at McCalls Ferry, Pa., 1902–1904.

[Drainage area 26,766 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1902.					
June	18,640	9,770	13,908	0.519	0.580
July	105,900	20,720	61,768	2.307	2.658
August	61,500	8,920	27,126	1.013	1.168
September	48,000	6,200	11,556	.431	.481
October	67,700	18,360	38,248	1.429	1.649
November	60,200	13,290	22,657	.846	.944
December	205,800	19,830	69,111	2.582	2.977

Estimated monthly discharge of Susquehanna River at McCalls Ferry, Pa., 1902–1904—Continued.

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1903.					
January	72,700	27,780	43,533	1.626	1.877
February	242,300	29,840	95,082	3.552	3.698
March	309,300	55,400	134,461	5.023	5.791
April	210,400	31,000	79,900	2.910	3.247
May	29,150	11,580	16,826	.628	.724
June	78,900	9,350	29,859	1.115	1.244
July	71,500	19,830	35,636	1.331	1.535
August	87,000	16,690	28,206	1.053	1.214
September	127,000	13,040	34,183	1.277	1.426
October	158,400	10,660	48,757	1.822	2.102
November	107,300	15,610	30,797	1.151	1.284
December	43,300	7,700	19,751	.737	.848
The year	309,300	7,700	49,638	1.854	25.019
1904.					
January	160,000	11,120	34,170	1.280	1.480
February	108,700	18,930	43,360	1.620	1.750
March	300,000	39,100	114,600	4.280	4.930
April	230,900	33,300	78,400	2.930	3.270
May	101,500	26,430	46,720	1.750	2.020
June	62,800	17,240	34,580	1.290	1.440
July	49,000	13,040	21,410	.800	.922
August	21,940	9,770	13,880	.519	.598
September	18,930	7,310	11,050	.413	.461
October	39,100	10,210	18,700	.698	.805
November	19,520	11,120	13,320	.498	.556
December	71,500	5,840	10,890	.407	.469
The year	300,000	5,840	36,760	1.370	18.700

CHEMUNG RIVER AT CHEMUNG, N. Y.[a]

A gaging station was established at the suspension bridge across Chemung River near Chemung station, September 7, 1903. Gage heights are taken each morning and night, by Daniel L. Orcutt, by a chain gage attached to the bridge. Current-meter measurements which have been made, and the mean daily stage of the stream, are shown in the accompanying tables. The gaging station is located 1 mile upstream from the New York-Pennsylvania line, and is shown on the Waverly sheet of the United States Geological Survey's topographic map of the country.

Chemung River is formed at Painted Post, N. Y., by the union of Tioga and Cohocton rivers. The Cohocton branch lies entirely in the State of New York. Tioga River receives, just above its mouth, Canisteo River, a large tributary, which also has its drainage basin in New York to the south of the Cohocton. The drainage of Tioga River above the Canisteo is mainly in Pennsylvania. The concentration, just above Corning, of the storm waters of these three main branches favors the formation of excessive floods.

Chemung River flows southeasterly through Corning, Elmira, and Chemung, crosses the State line, flows for a short distance in Pennsylvania, then returns to New York and again crosses to Pennsylvania near Waverly, finally emptying into Susquehanna River near Athens, Bradford County, Pa. The total length of the stream is about 40 miles, about 30 miles of which is in New York State. Chemung River is a sluggish stream with low banks and a broad valley or flood plain, which is often overflowed. It was formerly paralleled by a canal taking its supply from dams across the stream. This has been abandoned and at present the largest water-power development on the main river is at Elmira.

The topographic features of the drainage basin are, as a rule, bold and broad. The hills rise within a short distance of the stream several hundred feet on either side, and the upland plateau is to a large extent wooded, with impervious soil, no lake storage, and few marsh areas. Tributaries are ramifying and uniformly distributed, though not numerous, and dry gulleys or flood channels are common. Dikes have been erected in the cities of Elmira and Corning for protection against floods. One of the highest recorded freshets in the stream occurred June 1, 1889. It was preceded by phenomenal rainfall, on the night of May 31 and June 1, aggregating several inches in the course of a few hours. The discharge has been estimated at 67 second-feet per square mile from 2,055 square miles, or 138,000 cubic feet per second.[b]

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[a] Data on pages 140–153, inclusive, from Supplement of 1903 Report of New York State Engineer.

[b] Report of Francis Collingwood, C. E., on The Protection of the City of Elmira, N. Y., against Floods.

Discharge measurements of Chemung River at Chemung, N. Y.

Date.	Hydrographer.	Gage height.	Discharge.
1903.		*Feet.*	*Second-feet.*
August 27	C. C. Covert	2.89	809
September 7	R. E. Horton	3.29	1,354
October 2	H. H. Halsey	2.47	611
October 12	C. C. Covert	6.72	8,766
1904.			
March 11	C. C. Covert	5.75	6,170
April 9	R. E. Horton	5.64	5,717
July 15	C. C. Covert	3.05	1,042
September 9	do	1.90	220

Mean daily gage height, in feet, of Chemung River at Chemung, N. Y.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1										2.24	2.98	2.90
2										2.40	2.88	2.88
3										2.52	3.88	2.88
4										2.57	2.83	2.88
5										2.74	2.86	2.82
6										3.30	2.90	2.59
7									3.29	3.37	3.08	3.69
8									2.24	4.62	2.98	2.79
9									3.19	9.97	4.93	2.69
10									3.16	7.78	2.90	2.64
11									4.84	8.80	2.88	2.49
12									4.56	6.74	2.86	2.49
13									3.84	6.12	2.80	2.69
14									3.46	4.97	2.73	2.69
15									3.22	4.47	2.68	2.69
16									3.06	4.20	2.76	2.74
17									2.96	3.92	7.06	2.74
18									3.44	7.04	8.13	2.64
19									3.46	6.24	5.88	2.64
20									3.29	4.90	4.88	2.64
21									2.99	4.42	4.26	2.69
22									2.84	4.12	3.98	2.74
23									2.54	3.87	3.88	2.79
24									2.34	4.72	3.83	2.79
25									2.34	3.54	3.78	2.79
26									2.29	3.44	3.38	2.74
27									2.24	3.32	3.23	2.69
28									2.24	3.30	3.10	2.54
29									2.22	3.24	3.10	2.44
30									2.26	3.22	3.10	2.54
31										3.13		2.64
1904.												
1	3.00	[a]3.85	3.57	6.50	7.20	7.05	2.60	2.50	2.00	2.35	2.40	2.05
2	2.95	3.50	3.37	9.00	6.25	5.85	2.88	2.42	2.02	2.42	2.30	2.00
3	2.90	3.45	3.67	7.05	5.45	5.35	2.70	2.98	2.00	2.22	2.22	1.90
4	2.90	3.35	8.57	5.75	5.02	4.85	2.62	2.82	1.95	2.10	2.20	1.90
5	2.90	4.00	5.72	5.38	4.62	7.70	2.60	2.70	2.00	2.15	2.25	1.90
6	2.90	4.20	4.72	5.15	4.40	5.95	2.58	2.60	1.98	2.18	2.20	1.90
7	2.85	5.90	7.69	5.20	4.18	5.10	2.95	2.45	1.92	1.88	2.20	1.85
8	2.90	[a]16.70	[b]15.97	5.25	4.00	4.62	2.85	2.35	1.95	1.95	2.22	1.65
9	3.00	8.70	9.68	5.75	3.80	5.35	2.72	2.20	1.90	1.90	2.12	2.25
10	3.00	6.85	6.48	9.55	3.70	6.15	2.75	2.15	1.90	1.95	2.18	2.10
11	3.00	5.85	5.02	7.40	3.58	4.90	3.90	2.20	1.95	1.95	2.20	2.10
12	3.00	5.40	4.90	6.55	3.40	4.42	3.68	2.18	1.95	2.10	2.20	2.10
13	3.00	4.75	4.50	5.75	3.38	4.00	3.45	2.10	1.95	2.62	2.12	2.00
14	3.00	4.22	4.30	5.15	3.30	3.70	3.45	2.08	1.90	3.65	2.08	2.00
15	3.00	3.95	4.05	4.80	5.15	3.48	3.02	2.00	1.90	3.15	2.05	2.00
16	[c]3.15	3.65	3.88	4.80	6.75	4.05	2.82	2.00	1.90	2.82	2.25	2.00
17	3.20	[d]4.85	3.62	4.80	5.65	3.80	2.70	2.00	1.90	2.70	2.15	1.90
18	3.20	4.55	3.78	5.10	5.00	3.42	2.62	1.95	1.90	2.60	2.20	1.90
19	3.20	[e]4.30	3.92	5.10	9.45	3.22	2.50	1.95	1.90	2.50	2.05	1.95
20	3.20	4.15	5.98	4.85	8.40	3.12	2.40	2.05	1.88	2.45	2.00	2.00
21	3.35	4.00	6.78	4.42	6.60	3.02	2.30	2.05	1.80	2.52	2.00	2.10
22	3.50	[f]4.12	5.20	4.55	5.40	3.10	2.35	2.30	1.75	3.40	2.00	2.05
23	[g]11.35	4.05	[h]10.90	4.60	4.95	3.05	2.25	2.75	1.80	3.40	2.00	2.18
24	[a]9.55	4.32	11.40	4.50	5.35	3.05	2.72	2.88	1.82	3.18	2.02	2.10
25	6.65	4.12	10.25	4.55	5.25	2.88	2.78	2.70	2.00	3.05	2.20	2.10
26	5.30	4.05	[h]13.20	4.82	4.75	2.80	2.55	2.45	2.15	2.85	2.15	2.15
27	4.90	3.90	11.05	4.65	4.82	2.70	2.60	2.30	2.38	2.75	2.00	2.60
28	4.20	3.37	7.28	9.10	5.40	2.65	2.50	2.12	2.35	2.65	1.95	6.40
29	4.22	3.57	5.95	8.50	4.25	2.60	2.70	2.10	2.35	2.60	2.10	5.15
30	4.25		5.60	7.42	4.00	2.60	2.80	2.08	2.35	2.45	1.95	3.90
31	4.05		5.70		5.85		2.62	2.00		2.30		3.80

[a] No ice.
[b] Water over flats highest point 17 feet.
[c] River freezing over below gage.
[d] River frozen over.
[e] Thickness of ice 5 inches.
[f] Thickness of ice 12 inches.
[g] Ice running.
[h] River over the flats.

Rating table for Chemung River at Chemung, N. Y., from August 27, 1903, to December 31, 1904.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1.75	146	4.00	2,255	6.30	7,575	8.60	14,260
1.80	170	4.10	2,420	6.40	7,855	8.70	14,560
1.90	220	4.20	2,590	6.50	8,135	8.80	14,860
2.00	273	4.30	2,765	6.60	8,415	8.90	15,160
2.10	328	4.40	2,950	6.70	8,700	9.00	15,460
2.20	385	4.50	3,140	6.80	8,985	9.10	15,760
2.30	445	4.60	3,340	6.90	9,270	9.20	16,060
2.40	510	4.70	3,550	7.00	9,560	9.30	16,360
2.50	575	4.80	3,765	7.10	9,850	9.40	16,660
2.60	645	4.90	3,990	7.20	10,140	9.50	16,960
2.70	720	5.00	4,220	7.30	10,430	9.60	17,260
2.80	800	5.10	4,455	7.40	10,720	9.70	17,560
2.90	890	5.20	4,695	7.50	11,010	9.80	17,860
3.00	985	5.30	4,940	7.60	11,300	9.90	18,160
3.10	1,085	5.40	5,190	7.70	11,590	10.00	18,460
3.20	1,190	5.50	5,445	7.80	11,880	11.00	2,146
3.30	1,300	5.60	5,700	7.90	12,170	12.00	24,460
3.40	1,415	5.70	5,960	8.00	12,460	13.00	27,460
3.50	1,540	5.80	6,220	8.10	12,760	14.00	30,460
3.60	1,670	5.90	6,485	8.20	13,060	15.00	33,460
3.70	1,805	6.00	6,750	8.30	13,360	16.00	36,460
3.80	1,945	6.10	7,020	8.40	13,660		
3.90	2,095	6.20	7,295	8.50	13,960		

The above table is applicable only for open-channel conditions. It is based upon 8 discharge measurements made during 1903 and 1904. It is fairly well defined between gage heights 1.90 and 3.30 feet. The table has been extended above gage height 6.70 feet. Above gage height 8.0 feet the rating curve is a tangent, the difference being 300 per tenth. The rating table has been applied to the nearest hundredth of a foot to gage height 6.00, to the nearest half-tenth of a foot to gage height 9.00, to the nearest tenth of a foot above gage height 9.00 feet.

Mean daily discharge, in second-feet, of Chemung River at Chemung, N. Y.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1										409	966	890
2										510	872	872
3										589	2,065	872
4										624	827	872
5										752	854	818
6										1,300	890	638
7									1,289	1,380	1,065	1,791
8									409	3,382	966	792
9									1,180	18,460	4,059	712
10									1,148	11,880	890	675
11									3,855	14,860	872	568
12									3,260	8,840	854	569
13									2,005	7,020	800	712
14									1,490	4,157	748	712
15									1,212	3,083	705	712
16									1,045	2,590	768	752
17									947	2,127	9,705	752
18									1,465	9,705	12,910	675
19									1,490	7,435	6,432	675
20									1,289	3,990	3,945	675
21									975	2,988	2,695	712
22									836	2,454	2,223	752
23									603	2.050	2,065	792
24									471	3,593	1.990	792
25									471	1,592	1,917	792
26									439	1,465	1,392	752
27									409	1,323	1,223	712
28									409	1,300	1,085	603
29									397	1,234	1,085	536
30									421	1,212	1,085	603
31										1,116		675
1904.												
1				8,135	10,140	9,705	645	575	273	478	510	300
2				15,460	7,435	35,860	872	523	284	523	445	273
3				9,705	5,318	5,065	720	966	273	397	397	220
4				6,090	4,267	3,877	660	818	246	328	385	220
5				5,140	3,382	11,590	645	720	273	356	415	220
6				4,575	2,950	6,617	631	645	262	374	385	220
7				4,695	2,556	4,455	938	542	231	210	385	195
8			36,460	4,817	2,255	3,382	845	477	246	246	397	100
9			17,560	6,090	1,945	5,065	736	385	220	220	339	415
10			8,135	17,260	1,805	7,158	760	356	220	246	374	328
11			4,267	10,720	1,644	3,990	2,095	385	246	246	385	328
12			3,990	8,275	1,415	2,988	1,778	374	246	328	385	328
13			3,140	6,090	1,392	2,255	1,477	328	246	660	339	273
14			2,765	4,575	1,300	1,805	1,477	317	220	1,732	317	273
15			2,337	3,765	4,575	1,515	1,005	273	220	1,138	300	273
16			2,065	3,765	8,842	2,337	818	273	220	818	415	273
17			1,697	3,765	5,830	1,945	720	273	220	720	356	220
18			1,917	4,455	4,220	1,440	660	246	220	645	385	220
19			2,127	4,455	16,660	1,212	575	246	220	575	300	246
20			6,697	3,877	13,660	1,106	510	300	210	542	273	273
21			8,985	2,988	8,415	1,005	445	300	170	589	273	328
22			4,695	3,240	5,190	1,085	477	445	146	1,415	273	300
23			21,160	3,340	4,105	1,035	415	760	170	1,415	273	374
24			22,660	3,140	5,065	1,035	736	872	180	1,169	284	328
25			19,060	3,240	4,817	872	784	720	273	1,035	385	328
26			28,060	3,810	3,658	800	610	542	356	845	356	356
27			21,460	3,445	3,810	720	645	445	497	760	273	645
28			10,430	15,760	5,190	683	575	339	477	682	246	7,855
29			6,617	13,960	2,678	645	720	328	477	645	328	4,575
30			5,700	10,720	2,255	645	800	317	477	542	246	2,095
31			5,960		6,352		660	273		445		1,945

Estimated monthly discharge of Chemung River near Chemung, N. Y., for 1903-4.

[Drainage area, 2,440 square miles.]

Month.	Discharge in second-feet.			Run-off.	
	Maximum.	Minimum.	Mean.	Second-feet per square mile.	Depth in inches.
1903.					
September 7-30	3,855	397	1,146	0.47	0.42
October	18,460	409	3,981	1.63	1.88
November	12,910	705	2,265	.93	1.04
December	1,791	536	757	.31	.36
1904.					
March 8-31	36,460	1,697	10,331	4.23	3.90
April	17,260	2,988	6,645	2.72	3.03
May	16,660	1,300	4,940	2.02	2.33
June	35,860	645	4,063	1.67	1.86
July	2,095	415	820	.336	.387
August	966	246	463	.190	.219
September	497	146	267	.109	.122
October	1,732	210	656	.269	.310
November	510	246	347	.142	.158
December	7,855	100	785	.322	.371
The period	36,460	100	2,932	1.20	12.69

TIOUGHNIOGA RIVER AT CHENANGO FORKS, N. Y.

During the fall of 1903 the gaging station was established at this point in order to determine the low-water flow. Owing to the heavy rains which occurred that fall, as shown by the following table, the stage of the river did not fall as low as was expected.

Rainfall at Deruyter, N. Y., 1903.

	Inches.
September 1 to 10	0.00
September 11	.96
September 17 and 18	.71
September 27	.40
October 1 and 2	.71
October 5	.99
October 8 to 11	8.00
October 16 to 19	1.38
October 23 to 28	.39
November 5	.34
November 6 to 15	.12

The measurements were made at the highway bridge across the river at Chenango Forks. This bridge is located straight across the section of the channel and affords an excellent opportunity for

gagings, except at extreme high waters. Gage readings were taken during October and part of November from a staff gage fastened to the right-hand face of the center pier of the bridge. The drainage area of Tioughnioga River above the mouth at Chenango Forks, including the areas naturally tributary to the Tioughnioga, but now diverted to supply Erie Canal through the Erieville and Deruyter reservoirs is 735 square miles.

The following measurements were made at the station:

Date.	Hydrographer.	Gage height.	Discharge.
1903.			
September 11	C. C. Covert	2.0	992
September 30	H. H. Halsey	1.2	358

Mean daily gage height, in feet, of Tioughnioga River at Chenango Forks, N. Y.

Day.	Oct.	Nov.	Day.	Oct.	Nov.	Day.	Oct.	Nov.	Day.	Oct.	Nov.
1903.			1903.			1903.			1903.		
1	1.12	2.15	9	4.00	1.90	17	3.40		25	2.32	
2	1.20	1.95	10	(a)	1.90	18	4.50		26	2.30	
3	1.45	2.00	11	(a)		19	3.65		27	2.20	
4	1.22	1.95	12	4.30		20	3.10		28	2.15	
5	1.50	1.90	13	3.15		21	2.70		29	2.25	
6	2.45	2.05	14	2.80		22	2.45		30	2.25	
7	1.90	2.00	15	3.38		23	2.45		31	2.20	
8	2.10	1.95	16	3.35		24	2.45				

[a] Above gage.

CAYUTA CREEK AT WAVERLY, N. Y.

A record of the daily stage of Cayuta Creek at the Ithaca Street Bridge, a short distance below the milldam in Waverly, was kept by T. P. Yates, covering the period March 1, 1898, to March 31, 1902. The accompanying tables show the observed distance from the reference point on bridge to water surface, the mean of the several readings being used where more than one daily observation was taken.[a] Discharge measurements by means of floats were also made by Mr. Yates.

Cayuta Creek drains a long, narrow valley extending from eastern Schuyler County in a direction somewhat east of southerly a distance of 30 miles, the stream crossing the New York State line at Waverly and emptying into Susquehanna River at Sayre, Pa. In cross section the valley consists of a plain about one-half mile wide, through which the stream flows, bordered on both sides by abrupt slopes rising 500 feet within a distance of 1 or 2 miles from the foot on each side,

[a] Reference point is top iron hand rail at left-hand side second iron post from left-hand end of bridge on upstream side.

beyond which lies a plateau, cut by the numerous short lateral tributaries and their branches.

Cayuta Lake drains an area of 16.5 square miles at the head of the stream. The area of the lake is 0.78 square mile, and this constitutes the only storage in the drainage basin. The average width of the valley is about 6 miles. The conditions favor rapid concentration of the run-off in the main stream, there being no large branches. Maximum floods result, however, only from rapid inflow of sufficient duration to enable the waters from the whole length of the valley to reach the lower stretches of the stream at the same time. Cayuta Lake is at elevation 1,272 feet. The stream descends to elevation 800 feet at Waverly in a distance of 18 miles from Cayuta Lake, following the general trend of the valley, a limited amount of water power being developed at small dams.

Drainage areas of Cayuta Creek.[a]

	Area.	Total.
	Sq. miles.	*Sq. miles.*
Above outlet, Cayuta Lake	16	16
Above Van Etten	92	108
Above Ithaca Street Bridge, Waverly	41	149

[a] From Watkins, Ithaca, and Waverly sheets, U. S. G. S. topographic map.

Discharge measurements of Cayuta Creek at Waverly, N. Y.

Date.	Hydrographer.	Gage height.[a]	Discharge.
1903.		*Feet.*	*Second-feet.*
June 13	R. E. Horton	17.11	24.9
August 27	C. C. Covert	17.25	46.3
October 2	H. H. Halsey	17.00	25.4
October 12	H. H. Halsey	14.45	698

[a] Gage inverted.

Mean daily gage height, in feet, of Cayuta Creek at Waverly, N. Y., 1898–1902.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1898.												
1			16.90	16.00	16.30	16.80	17.50	17.70	17.20	17.80	16.70	16.70
2				16.20	16.40		17.60		17.30		16.80	16.80
3			16.80	16.40		16.90		17.80	17.40		16.90	
4				16.50	16.30			17.30	17.50			
5			16.90	16.60	16.50	17.00		17.05			17.00	16.70
6					15.60	17.10		17.10	17.60			
7			16.80	16.70	16.20	17.30		17.40	16.87		17.10	
8			16.50	16.80	16.40	17.00		17.70	16.70	17.30		16.80
9				16.90	16.50	17.10			17.00	17.40	17.20	16.90
10			16.30		16.60	17.20			17.30	17.60	14.87	17.00
11			14.60		16.70	16.63			17.40	17.70	13.30	17.10
12			13.00		16.60	16.90				17.80	15.25	
13			15.00		16.40	17.00		17.60	17.50	17.70	15.70	17.20
14			15.30	17.00	16.60	17.00	17.70	17.50	17.50	16.54	16.00	
15			15.50		16.70	17.10		17.60	17.60	16.30	16.30	
16			15.80		16.23	17.20				16.85	16.60	
17			16.00	17.10	16.20	17.20		17.50		17.00	16.70	
18			16.20	17.20	16.40	17.40				17.10	16.70	
19			16.30		15.37			17.25	17.70	17.00	16.40	
20			16.00	17.30	14.50	17.30		17.40		16.63	15.73	17.00
21			16.40		15.20			17.50		16.60	16.10	16.35
22			15.40		15.70	17.40	17.50			14.52	16.30	16.15
23			14.30	17.30	16.20		17.60	17.60		15.05	16.40	13.80
24			15.00	12.05	15.33		17.70	17.70		16.00	16.50	14.70
25			15.40	12.25		17.50	17.80	17.35		16.30	16.60	15.80
26			15.80	13.40	15.95		17.50	17.30	17.80	16.36		16.00
27			16.00	14.90	16.00	17.40	17.60			15.20	16.70	16.50
28			16.10	15.50	16.30		17.70	17.50		16.10	16.60	16.60
29			15.40	15.80	16.50		17.60	17.60		16.40		16.70
30				16.00	16.60		17.70	16.57		16.60	16.70	16.80
31			15.80		16.70			17.00				16.90
1899.												
1	15.80	17.80	15.50	15.80	17.00	17.30	17.80	17.90	17.90	17.90	15.08	17.70
2	16.20		16.00	15.90	17.10	16.45					15.40	
3	16.30	17.60	16.20	16.00		17.00					15.90	
4			14.40	16.30		17.20						
5	14.03	17.20	13.20	16.50		17.30					16.50	17.80
6	15.55		14.00	16.60		17.40		18.00		18.00	16.60	
7	15.80		14.60	16.70	17.30						16.70	
8	16.00		16.00	14.60		17.30	17.90				16.80	
9	16.10		16.30	15.00		17.40	15.60				16.90	
10	16.40			15.80		17.50	17.20	18.10	18.00		17.00	
11			16.40	16.20			17.30				17.10	
12	16.50	17.10	15.20	15.35	17.20	17.60					16.50	16.02
13	16.70		14.46	14.40	17.30			18.00			16.90	16.40
14			15.70	14.90	17.40							
15	14.90	17.20	16.00	15.40			17.80					66.50
16	15.60		16.00			17.70	17.50	18.00		18.10	17.00	
17	15.80	17.30	16.30	15.90	17.30		17.30					16.70
18	15.90		16.60	16.30	17.26	17.80	16.80					16.70
19			15.90	16.40	17.20							
20	16.00	17.20	16.10				17.40					
21	16.30	16.70	16.60								17.20	16.80
22	16.50	16.00	16.30		17.30							
23	16.80	14.80	15.40	16.60			17.60					
24	17.20	15.40	15.90	16.60								16.90
25	17.40		16.20	16.70		17.55					17.40	15.00
26	17.60	16.30	16.50	16.60	17.40			18.10				15.70
27	17.70	15.60	16.00	16.70					17.90			15.90
28	17.80		15.70	16.80		17.70		17.77				16.00
29			15.50		17.50						17.60	16.30
30			15.90	16.80	17.20	17.80	17.90	17.90			17.70	16.60
31			15.80		17.20							16.90

Mean daily gage height, in feet, of Cayuta Creek at Waverly, N. Y., 1898–1902—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900.												
1	16.90	16.90	14.08	16.10	14.30	17.30	17.90	18.10	18.20	18.30	18.30	15.00
2			14.00	15.20								15.50
3		17.00	15.40	14.30	16.40	17.10						15.70
4		17.10	15.80	14.70		17.20						15.50
5		16.50	16.10	15.60	16.50							14.06
6			16.40	15.05		17.30	17.60					14.60
7		16.80	16.70	13.76	16.60	17.50	17.50					15.00
8			16.60	13.80		17.50	17.70					15.20
9	17.00	16.50	16.40	15.50	16.70	17.40						15.60
10		14.00	15.40	16.00		17.50						15.80
11		15.40	15.90				17.80					16.00
12		16.40	16.00	16.10								16.20
13		15.50	16.20		16.80							16.30
14		15.60	16.40			17.60						16.40
15		16.00	16.70								18.20	16.50
16		16.40	16.90	15.90								
17		16.60		15.15	16.90	17.70						16.60
18		16.80		14.45			17.90					
19	17.00	17.00	16.60	14.90		17.80						16.70
20	13.50		13.70	15.50		17.60						
21	12.55	17.20	15.40	16.20	12.00							16.80
22	15.10	12.13	16.40	16.00								
23	15.70	12.20	15.20	15.50			18.00				18.10	16.80
24	16.10	15.40	15.05	16.00		17.70						15.35
25	16.70	15.00			17.10					18.20	18.00	15.60
26	14.70	15.80		16.10		17.80				18.25	10.30	15.90
27	15.90	16.20	16.20				18.10			18.30	11.75	16.20
28	16.40	16.70	16.10	16.20	17.20						14.40	16.40
29	16.80		16.20								14.50	16.50
30				16.30		17.90					14.70	
31	16.90		16.30		17.30							
1901.												
1	16.5	17.3	17.5	15.7	16.1	14.8	17.3	17.6	17.1	17.4	17.8	17.3
2	16.7			15.95	16.2	15.06		17.6	16.9	17.5		
3	16.8	17.4		15.45	15.85	15.2			17.1	17.4		16.8
4	16.9		17.45	15.1	16.2	15.5	17.4		17.2			
5			17.4	15.2	16.3	15.9	17.4	17.7	17.3			
6			17.5	14.05	16.5	16.1	17.0	17.8	17.4	17.5		16.9
7	17.0			12.35	16.6	15.86	17.1	17.7	17.5	17.6		
8				12.90	16.7	15.3	17.3	17.4	17.6			17.0
9			17.3	13.90		16.0			17.7			17.05
10	16.95	17.5	16.9	14.1		16.3		17.6				14.86
11	16.4		13.25	14.7	16.6	16.5						15.0
12	15.63		14.0	14.9	16.5	16.8	17.5	17.7				16.2
13	16.1		15.2	15.0	16.4							16.3
14	16.5		15.65	15.3	16.5				17.5	17.5	17.7	13.48
15	16.5		15.15	15.6	16.7			17.7	17.4			9.80
16	16.0		15.35	15.8	16.8			17.0				13.35
17	16.1	17.5	15.6	15.9	16.9	17.0		17.3	17.3			14.4
18	16.5		15.36	16.0	16.9							15.0
19			14.2	16.1	16.7		17.4	17.4	17.4			15.4
20	16.6		15.4	14.75	16.9	16.9	17.5	17.4			17.8	15.6
21	16.7		12.52	11.75				17.0				15.7
22	16.8		14.26	11.83	16.85	17.0		17.3	17.5			15.8
23	16.9		15.1	13.4	16.80			17.4		17.6		16.0
24	17.1	17.5	14.2	13.75	16.50		17.6				15.16	16.2
25			13.3	14.1	16.40	17.1	17.7		17.6		14.7	
26			12.26	14.6	16.5	17.2			17.7		15.0	16.3
27			11.73	15.1	16.5		17.5		17.4	17.7	16.2	
28			13.5	15.5	15.58	17.3					16.6	
29			14.8	15.8	13.3		17.6				17.1	16.4
30	17.2		15.2	16.0	13.85		17.4	17.5		17.8	17.2	16.0
31			15.5		14.6			17.5				16.1

Mean daily gage height, in feet, of Cayuta Creek at Waverly, N. Y., 1898–1902—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.												
1	16.2	15.6	9.5									
2	16.4		11.2									
3	16.3		11.5									
4	16.4		13.5									
5			14.8									
6			15.4									
7	16.5	16.0	15.0									
8			15.0									
9			14.8									
10	16.7		14.3									
11			14.0									
12	16.9		13.9									
13			12.7									
14	17.0		13.5									
15		16.4	14.3									
16	17.1		14.2									
17	17.2		11.5									
18	17.3		14.0									
19	17.4		14.8									
20	17.5	16.5	15.0									
21			15.2									
22	15.5		15.4									
23	13.15		15.4									
24	14.0		15.6									
25	15.0	16.8	15.8									
26	15.4		16.0									
27	15.4	16.65	16.2									
28	15.0	12.4	16.4									
29	15.4		16.4									
30	15.8											
31			16.4									

CHENANGO RIVER AT OXFORD, N. Y.

A temporary board gage was attached to the upstream side of the left-hand abutment of the highway bridge across Chenango River at South Oxford, N. Y., September 29, 1903, and observations of the stream stage were taken twice daily from that date until November 7, 1903. The desired data relative to low-water flow could not be obtained on account of heavy rains. The precipitation during the period of observation, as recorded at Oxford, is given below:

Precipitation at Oxford, N. Y.

	Depth.
1903.	*Inches.*
September 1–10	T.
September 11	0.64
September 17	.72
September 27–28	.16
October 5	1.14
October 8–12	3.71
October 16–19	1.72
October 23–27	.49
November 5	.34
November 6–15	.12

South Oxford is located on Chenango River 18 miles above the inflow of Tioughnioga River. The drainage area is 453 square miles gross, or 423 square miles net, excluding 30 square miles tributary to the reservoirs which supply Erie Canal summit level during the navigation period.

Mean daily gage height, in feet, of Chenango River at South Oxford, N. Y.

Day.	Sept.	Oct.	Nov.	Day.	Sept.	Oct.	Nov.	Day.	Sept.	Oct.	Nov.
1903.				1903.				1903.			
1	......	0.85	1.80	12	......	4.55	......	22	......	2.55	......
2	......	.85	1.70	13	......	3.65	......	23	......	2.40	......
3	......	1.00	1.70	14	......	2.90	......	24	......	2.20	......
4	......	.90	1.60	15	......	2.55	......	25	......	2.15	......
5	......	1.35	1.65	16	......	2.30	......	26	......	2.00	......
6	......	1.80	1.75	17	......	2.35	......	27	......	1.90	......
7	......	1.45	1.65	18	......	4.90	......	28	......	1.95	......
8	......	1.65	......	19	......	4.30	......	29	0.90	1.95	......
9	......	4.35	......	20	......	3.40	......	30	.85	1.90	......
10	......	7.40	......	21	......	2.90	......	31	......	1.85	......
11	......	6.50	......								

EATON AND MADISON BROOKS, MADISON COUNTY, N. Y.

Records of the flow of Eaton and Madison brooks, two small streams near the headwaters of Chenango River, are among the earliest, if not the first, systematic stream gagings in the United States. The flow of these streams was determined by John B. Jervis in 1835 in an investigation of water supply for the summit level of Chenango Canal, extending from Utica to Binghamton, and now abandoned.

The headwaters of Chenango River, including Eaton and Madison brooks and the storage reservoirs which have been constructed to supply the summit level of Erie Canal through Oriskany Creek, are shown on the Morrisville, Cazenovia, Norwich, and Pitcher sheets of the United States Geological Survey topographic map.

Eaton Brook drainage basin is from 1½ to 3 miles in width and 7 miles in length. It contains near its head Eaton reservoir, at an elevation of about 1,430 feet. The slopes are steep; the soil is close textured, with shale near the surface. Tributaries are few, and the fall is rapid.

The soil and topography of Madison Brook are similar, the area consisting of rounded hill slopes with a somewhat more porous soil, greater breadth, and more tributaries than in the Eaton Brook area.

It is stated that the Eaton Brook and Madison Brook gagings show only the volume of water passed downstream from the reservoirs.

Estimated monthly discharge of Eaton Brook, Madison County, N. Y.

[Drainage area, 10.62 square miles.]

Month.	Mean discharge in second-feet.	Run-off.		Rainfall, inches.
		Second-feet per square mile.	Depth in inches.	
1835.				
January				
February				
March				
April				
May				
June	22.15	2.08	2.32	6.72
July	10.46	.98	1.13	2.74
August	5.06	.48	.55	2.86
September	3.70	.35	.39	1.34
October	7.73	.73	.84	3.00
November	9.17	.86	.96	2.20
December	12 89	1.21	1.39	.96
The period			7.58	19.82
Per cent run-off				38

Estimated monthly discharge of Madison Brook, Madison County, N. Y.

[Drainage area, 9.37 square miles.]

Month.	Mean discharge in second-feet.	Run-off.		Rainfall, inches.[a]
		Second-feet per square mile.	Depth in inches.	
1835.				
January	8.66	0.93	1.07	2.17
February	10.49	1.12	1.16	2.50
March	16.16	1.73	1.99	1.03
April	31.16	3.33	3.71	5.00
May	21.66	2.32	2.67	1.98
June	7.77	.83	.93	8 05
July	8.64	.92	1.06	3.87
August	8.86	.95	1.10	3.06
September	7.39	.79	.88	.88
October	7.30	.78	.90	3.86
November	7.03	.75	.84	2.10
December	7.24	.77	.89	.76
The year			17.20	39.26
Per cent run-off				44

DIVERSIONS FROM CHENANGO RIVER DRAINAGE BASIN.

An examination was made of the diversion from Chenango River drainage basin to supply Erie Canal during September, 1903.

Proceeding upstream from along the feeder which enters Oriskany Creek at Solsville, the draft from the storage reservoirs was observed as follows:

Leland Ponds, well drawn down, September 11, 1903, outflow about 9 second-feet.

Chenango Feeder above inflow from Leland Ponds, September 11, 1903, about 30 se ond-feet.

Approximate total diversion, 39 second-feet.

The outflow from the several reservoirs proceeding upstream was approximately as follows:

Madison reservoir, September 11, 1903, 10 second-feet.

Flow in Chenango feeder at first bridge above Hamilton, also above Madison reservoir outlet, about 23 second-feet.

The outflow from the remaining reservoirs in the Chenango River area, Kingsley, Bradley Brook, and Eaton reservoirs, respectively, was slight. Their combined outflow passes a diverting dam above Randalsville, the waste from which, together with waste and seepage from the feeder, enters the natural channel of Chenango River. The flow in this river channel at the bridge above Earlville September 12, 1903, was approximately 44 second-feet.

PRECIPITATION.

During the last few years the United States Weather Bureau has maintained about 47 precipitation stations in the Susquehanna River drainage area (see list on p. 160). The locations of these stations and of the gaging stations are indicated in fig. 1 (p. 11).

In order to compare the relation of rainfall to run-off in the Susquehanna basin, the run-off at Harrisburg has been taken as representative of the whole basin, and that at Wilkesbarre and Williamsport as representative of the main stream above Sunbury and the West Branch, respectively.

The rainfall stations are so distributed as to represent fairly well the conditions over each of these areas. Therefore, it is assumed that for any one month the mean rainfall over the whole of any of these areas is the mean of the monthly rainfall at the various stations in that area. Based upon this assumption, the monthly and yearly rainfall for each of the years when the run-off records are available has been determined, as shown in tables on pages 161–171.

An examination of the tables on pages 156 and 157, which give a comparison of the rainfall and run-off above Harrisburg, shows that the mean annual rainfall over the drainage area varies from 31.4 to

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[a] Snow of November and December, 1904, on ground.

44.3 inches, with a mean for the fourteen years of 39.4. This yields a run-off of from 16.6 to 29.1 inches, with a mean of 21.6. The amount of rainfall which runs off varies from 49 to 71 per cent of the total, with a mean of 54 per cent. The run-off is a minimum in August, September, and October, during which months it ranges from 5 to 30 per cent of the rainfall, and averages about 15 per cent.

As complete snowfall data are not available, it has been impossible to allow for the snow storage, which accounts for the high percentages in the late winter and early spring. To fully account for this storage a cube of snow should be melted at the end of each month in order to determine the amount of water stored during that time. The quantity available for run-off during the following month would be the amount so determined plus the precipitation during the following month minus the amount left in snow storage at the end of that month. Unfortunately sufficient data of this kind are not available, and therefore no attempt has been made to account for this disturbing feature.

The tables on pages 158 and 159 show that the conditions on the main stream above Wilkesbarre and the West Branch taken separately are practically the same as when taken together in connection with the entire river as referred to above.

Rainfall stations in the portion of the Susquehanna River drainage basin above Harrisburg.

NEW YORK.

[a]2. Cooperstown.	10. Perry City.
4. New Lisbon.	11. Wedgwood.
6. South Kortright.	14. South Canesteo.
7. Oxford.	15. Addison.
9. Binghamton.	16. Elmira.

PENNSYLVANIA.

20. Wellsboro.	35. Selinsgrove.
21. Leroy.	38. State College.
24. South Eaton.	40. Altoona.
26. Wilkesbarre.	41. Huntingdon.
29. Emporium.	42. Harrisburg.
31. Lock Haven.	43. Lebanon.
32. Lewisburg.	46. York.

In the following table are shown the rainfall and run-off in the Susquehanna drainage basin above Harrisburg. The computations are based on the flow at the Harrisburg gaging station and the rainfall at the 24 stations listed above.

[a]The number refers to the accompanying map (fig. 1, p. 11), on which the locations of the stations are shown.

Rainfall and run-off in the portion of the Susquehanna River drainage basin above Harrisburg, Pa.

Month.	1891.			1892.			1893.		
	Rain-fall, inches.	Run-off.		Rain-fall, inches.	Run-off.		Rain-fall, inches.	Run-off.	
		Inches.	Per cent of rain-fall.		Inches.	Per cent of rain-fall.		Inches.	Per cent of rain-fall.
January	3.98	3.466	87	4.40	3.787	86	2.30	0.745	32
February	3.77	6.099	162	1.72	1.003	58	4.55	2.409	53
March	3.89	4.672	120	4.11	2.461	60	2.68	4.474	167
April	1.97	3.706	188	1.49	3.701	25	4.06	4.800	118
May	1.56	.921	59	5.97	3.227	54	6.05	4.371	72
June	3.93	1.178	30	5.71	3.029	53	3.15	.865	27
July	5.07	1.041	21	4.62	.777	17	3.26	.490	15
August	4.84	1.467	30	4.60	.896	19	4.84	.272	6
September	1.91	1.101	58	2.30	.521	23	3.00	.872	29
October	3.49	.892	26	.95	.288	30	2.76	.895	32
November	2.63	1.583	60	3.45	.505	15	2.03	.716	35
December	4.13	3.022	73	1.28	.775	61	2.69	1.939	72
The year	41,17	29.148	71	40.60	20.970	52	41.37	22.848	55

Month.	1894.			1895.			1896.		
January	2.25	1.296	58	3.32	2.405	72	1.90	2.523	133
February	2.93	1.367	47	1.11	2.320	209	4.49	2.355	52
March	1.21	3.348	277	1.78	3.822	214	3.98	3.087	78
April	4.41	3.037	69	2.50	3.940	158	1.27	4.109	324
May	7.70	4.540	59	2.84	1.201	42	2.89	.606	21
June	2.81	2.314	82	3.47	.504	14	4.34	.893	21
July	2.42	.482	20	2.66	.450	17	5.14	.729	14
August	2.19	.318	15	3.93	.252	6	1.92	.695	36
September	5.61	.802	14	2.17	.242	11	4.01	.193	5
October	4.64	1.242	27	1.46	.159	11	3.88	1.653	43
November	2.04	2.152	105	2.52	.283	11	2.89	1.647	57
December	3.28	1.689	51	3.65	.892	24	1.04	1.035	100
The year	41.49	22.587	54	51.41	16.470	52	37.75	19.525	52

Rainfall and run-off in the portion of the Susquehanna River drainage basin above Harrisburg, Pa.—Continued.

Month.	1897.			1898.			1899.			1900.		
		Run-off.			Run-off.			Run-off.			Run-off.	
	Rain-fall, inches	Inches	Per cent of rain-fall.	Rain-fall, inches	Inches	Per cent of rain-fall.	Rain-fall, inches	Inches	Per cent of rain-fall.	Rain-fall, inches	Inches	Per cent of rain-fall.
January	1.77	0.892	50	3.65	2.806	77	2.29	2.132	93	2.28	2.737	120
February	2.33	2.007	86	1.79	2.290	128	3.22	1.998	62	3.69	2.766	75
March	3.22	4.233	131	3.46	4.250	123	3.94	4.842	123	3.52	3.238	92
April	3.03	2.590	85	2.97	2.467	83	1.63	3.111	191	1.52	2.703	178
May	4.72	2.584	55	4.74	2.845	60	3.48	1.216	35	2.20	.923	42
June	3.24	.819	25	2.77	.927	33	3.25	.534	16	2.95	.609	21
July	4.53	.545	12	3.12	.384	12	2.76	.375	14	3.68	.342	9
August	3.11	.730	23	6.35	1.249	20	4.08	.350	9	3.04	.243	8
September	2.90	.314	11	2.04	.522	26	3.70	.299	8	1.41	.173	12
October	1.19	.284	24	5.74	1.578	28	1.68	.198	12	3.35	.208	6
November	4.42	1.003	23	3.23	1.908	59	2.70	.872	32	4.43	1.091	25
December	3.27	2.235	68	2.43	1.666	69	2.95	1.545	52	2.12	1.762	83
The year	37.73	18.246	48	42.29	22.892	54	35.68	17.472	49	34.19	16.595	49

Month.	1901.			1902.			1903.			1904.		
January	1.81	0.673	37	2.31	1.775	77	3.23	1.812	56	3.31	1.470	44
February	.93	.868	93	3.41	2.044	60	3.71	4.040	109	2.16	1.740	81
March	3.52	3.888	110	3.88	7.456	192	4.58	6.405	140	3.43	4.890	142
April	4.46	4.827	108	2.87	3.163	110	2.76	3.840	139	3.28	3.450	105
May	5.68	3.069	54	1.63	.739	45	1.27	.686	54	3.82	2.010	53
June	2.96	2.557	86	6.17	.595	10	6.44	1.298	20	3.37	1.360	40
July	3.96	.649	16	7.24	3.252	47	4.52	1.560	35	4.95	.865	17
August	6.24	1.596	26	2.76	1.294	47	6.48	1.227	19	3.94	.500	13
September	3.01	1.025	34	4.12	.544	13	1.95	1.417	73	3.20	.402	13
October	1.43	.631	44	4.13	1.711	41	4.94	2.167	44	2.71	.731	27
November	2.30	.689	30	1.24	.974	79	2.02	1.266	63	.92	.500	54
December	5.63	3.527	63	4.56	3.060	67	2.42	.948	39	2.13	.405	19
The year	41.93	23.999	57	44.32	26.724	60	44.32	26.666	60	37.22	18.320	49

Rainfall stations in the portion of the Susquehanna River drainage basin above Wilkesbarre.

NEW YORK.

1. Richmondville.
2. Cooperstown.
3. Bouckville.
4. New Lisbon.
5. Oneonta.
6. South Kortright.
7. Oxford.
8. Cortland.
9. Binghamton.
10. Perry City.
11. Wedgwood.
12. Atlanta.
13. Angelica.
14. South Canisteo.
15. Addison.
16. Elmira.
17. Waverly.

PENNSYLVANIA.

18. Athens.
19. Lawrenceville.
20. Wellsboro.
21. Leroy.
22. Towanda.
23. Dushore.
24. South Eaton.
25. Scranton.
26. Wilkesbarre.
34. Girardville.

In the following table are shown the rainfall and run-off in the portion of the Susquehanna basin above Wilkesbarre. The computations are based on the flow at the Wilkesbarre gaging station and the rainfall at the 27 stations listed above.

Rainfall and run-off in the portion of the Susquehanna River drainage basin above Wilkesbarre, Pa.

Month.	1899.			1900.			1901.		
	Rain-fall, inches.	Run-off.		Rain-fall, inches.	Run-off.		Rain-fall, inches.	Run-off.	
		Inches.	Per cent of rain-fall.		Inches.	Per cent of rain-fall.		Inches.	Per cent of rain-fall.
January	2.14			2.43	2.078	85	1.69	3.402	201
February	2.67			3.46	2.987	86	1.17	1.696	145
March	3.60			3.59	2.773	77	3.36	4.044	120
April	1.63	3.262	200	1.50	2.988	199	4.67	4.465	96
May	2.78	.876	32	1.97	.660	33	5.39	2.490	46
June	3.11	.354	11	2.94	.364	12	3.11	1.712	55
July	3.13	.235	8	4.13	.269	7	4.03	.337	8
August	3.76	.197	5	2.73	.201	7	5.96	.831	14
September	3.14	.138	4	1.40	.148	11	2.94	.434	15
October	1.85	.136	7	3.58	.141	4	1.69	.382	23
November	2.58	.724	28	4.70	1.226	26	2.68	.563	21
December	3.19	1.470	46	2.29	3.206	140	5.58	4.902	88
The year	33.53	7.571		34.73	16.977	49	42.27	25.258	60

Month.	1902.			1903.			1904.		
January	2.00	3.144	157	2.64	3.441	130	3.40	2.570	76
February	3.03	2.432	80	2.93	3.715	127	1.99	3.920	197
March	3.51	7.838	223	4.77	6.289	132	3.17	6.160	195
April	2.54	2.441	96	2.30	2.654	115	2.79	3.560	128
May	2.17	.495	23	1.11	.366	33	3.69	1.860	50
June	5.87	.489	8	6.38	1.134	18	3.27	1.270	39
July	7.86	3.401	43	4.39	.842	19	4.96	.428	9
August	2.88	1.115	39	6.51	1.446	22	4.26	.529	14
September	4.32	.543	13	1.67	1.157	69	3.69	.469	13
October	3.83	1.674	44	6.04	3.183	53	3.00	1.330	44
November	1.13	.861	76	2.21	1.382	62	1.18	.679	58
December	4.04	2.999	74	2.44	1.543	63	2.24	.900	40
The year	43.18	27.317	63	43.32	27.153	63	37.64	23.760	63

Rainfall stations in the portion of the West Branch of the Susquehanna River drainage basin above Williamsport.

20. Wellsboro.
21. Leroy.
27. Williamsport.
29. Emporium.
31. Lock Haven.
36. Center Hall.
38. State College.
39. Grampian.

In the following table are given the rainfall and run-off in the portion of the West Branch of Susquehanna River drainage basin above Williamsport. The computations are based on the flow at the Williamsport gaging station and the rainfall at the eight stations listed above.

Rainfall and run-off in the portion of the West Branch of the Susquehanna River drainage basin above Williamsport.

Month.	1895.			1896.			1897.		
	Rain-fall, inches.	Run-off.		Rain-fall, inches.	Run-off.		Rain-fall, inches.	Run-off.	
		Inches.	Per cent of rain-fall.		Inches.	Per cent of rain-fall.		Inches.	Per cent of rain-fall.
January	3.74	....	....	1.51	1.167	77	2.04	1.012	50
February	1.04	....	....	4.00	2.077	52	2.95	1.754	59
March	2.02	4.241	210	3.84	2.822	74	3.77	5.231	139
April	2.33	3.990	171	1.44	3.980	276	3.21	2.744	85
May	3.33	1.128	34	2.06	.787	38	4.47	2.921	65
June	4.66	.688	15	4.48	1.475	33	3.18	.602	19
July	3.00	.602	20	5.75	1.283	22	5.28	.696	13
August	3.57	.387	11	2.26	1.305	58	3.30	.759	23
September	2.31	.204	9	4.70	.309	7	3.37	.337	10
October	1.26	.152	12	4.22	2.685	64	1.16	.263	23
November	2.42	.289	12	2.75	1.734	63	4.91	1.329	27
December	3.74	.924	25	1.25	1.276	102	3.54	2.345	66
The year	33.43	....	....	38.26	20.899	55	41.18	19.993	49

Month.	1898.			1899.			1900.		
January	3.69	3.230	87	2.49	2.453	99	2.46	2.848	116
February	1.54	2.254	146	3.46	1.717	50	3.71	2.602	70
March	5.20	6.410	123	3.89	5.622	144	3.87	3.197	83
April	2.98	2.552	86	1.85	3.104	168	1.33	2.768	208
May	4.26	2.154	50	3.70	1.530	41	2.22	1.006	45
June	3.37	.848	25	3.60	.539	15	2.94	.800	27
July	2.92	.420	14	2.77	.357	13	3.63	.418	12
August	5.47	.914	17	4.18	.273	7	3.24	.267	82
September	1.23	.302	25	3.50	.365	10	1.05	.184	17
October	6.22	1.507	24	1.87	.206	11	3.71	.372	10
November	2.68	1.684	63	2.77	1.136	41	4.43	1.845	42
December	2.81	1.552	55	3.95	1.892	48	2.05	1.750	85
The year	42.38	23.827	56	38.02	19.194	50	34.64	18.057	52

Month.	1901.			1902.			1903.		
January	1.83	1.060	58	2.46	1.449	59	3.09	2.032	66
February	1.28	.556	43	3.19	1.572	49	3.68	4.516	123
March	3.42	4.280	126	4.04	8.092	200	4.41	7.200	163
April	4.69	5.447	116	3.24	3.975	123	3.23	3.526	109
May	5.41	3.148	58	1.90	.963	51	1.74	.601	34
June	3.69	2.436	66	5.72	.667	12	6.03	1.569	26
July	3.79	.595	16	7.58	4.108	54	5.30	1.992	38
August	6.62	1.441	22	2.72	.995	37	5.44	1.230	23
September	3.19	1.245	39	3.68	.340	9	2.08	1.165	56
October	.89	.433	49	3.18	.725	23	4.32	1.699	39
November	2.89	.844	29	1.43	.486	34	2.55	1.735	68
December	5.48	4.145	76	4.12	2.556	62	2.36	.719	30
The year	43.18	25.630	59	43.26	25.928	60	44.23	27.984	63

Month.	1904.		
January	3.44	1.940	56
February	2.30	1.970	86
March	5.03	7.380	147
April	4.44	4.700	106
May	3.69	2.470	69
June	3.73	1.420	38
July	4.70	1.270	27
August	3.32	.315	9
September	2.63	.231	9
October	2.20	.472	21
November	.54	.326	60
December	2.18	.334	15
The year	38.20	22.830	60

Rainfall stations in Susquehanna drainage basin.

No.[a]	Station.	County.	Elevation above sea level.
	NEW YORK.		Feet.
1	Richmondville	Schoharie	500
2	Cooperstown	Otsego	1,250
3	Bouckville	Madison	1,350
4	New Lisbon	Otsego	1,234
5	Oneonta	do	1,100
6	South Kortright	Delaware	1,700
7	Oxford	Chenango	550
8	Cortland	Cortland	1,130
9	Binghamton	Broome	854
10	Perry City	Schuyler	1,038
11	Wedgwood	do	1,350
12	Atlanta	Steuben	1,200
13	Angelica	Allegany	1,340
14	South Canisteo	Steuben	1,480
15	Addison	do	993
16	Elmira	Chemung	856
17	Waverly	Tioga	824
	PENNSYLVANIA.		
18	Athens	Bradford	768
19	Lawrenceville	Tioga	1,006
20	Wellsboro	do	1,327
21	Leroy	Bradford	1,400
22	Towanda	do	754
23	Dushore	Sullivan	1,590
24	South Eaton	Wyoming	660
25	Scranton	Lackawanna	805
26	Wilkesbarre	Luzerne	541
27	Williamsport	Lycoming	530
28[b]	Renovo	Clinton	672
29	Emporium	Cameron	1,029
30[b]	St. Marys	Elk	1,740
31	Lock Haven	Clinton	560
32	Lewisburg	Union	450
33[b]	Drifton	Luzerne	1,633
34	Girardville	Schuylkill	1,018
35	Selinsgrove	Snyder	455
36	Center Hall	Center	1,272
37[b]	Bellefonte	do	744

[a] The numbers indicate locations on map, fig. 1, p. 11. [b] Data incomplete, not used.

Rainfall stations in Susquehanna drainage basin—Continued.

No.	Station.	County.	Elevation above sea level.
	PENNSYLVANIA—continued.		*Feet.*
38	State College	Center	1,191
39	Grampion	Clearfield	1,570
40	Altoona	Blair	1,179
41	Huntingdon	Huntingdon	650
42	Harrisburg	Dauphin	317
43	Lebanon	Lebanon	458
44[a]	Ephrata	Lancaster	381
45[a]	Lancaster	do	413
46	York	York	381
47[a]	Everett	Bedford	1,060

[a] Data incomplete, not used.

Monthly and annual precipitation at stations in Susquehanna drainage basin.

1.[a] RICHMONDVILLE, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	[2.02]	[2.48]	6.24	1.62	2.75	2.32	[5.74]	1.20	3.22	1.15	1.58	2.85	33.17
1900	3.21	3.61	4.06	2.35	2.23	2.37	5.63	3.39	1.34	2.61	3.74	1.96	36.50
1901	1.69	.66	2.09	6.82	5.22	2.54	7.24	5.38	3.24	2.19	1.62	3.83	42.52
1902	1.38	3.11	3.54	3.99	2.39	4.81	6.95	3.05	4.49	3.81	1.05	4.45	43.50
1903	1.78	2.54	5.16	1.03	.22	8.84	3.12	5.66	1.23	6.78	1.68	2.42	40.46
1904	3.21	2.18	3.27	2.47	1.10	3.61	3.27	4.20	3.86	4.16	1.26	2.62	35.21
Mean	2.22	2.43	4.06	3.05	2.32	4.08	5.32	3.81	2.90	3.45	1.82	3.02	38.48

2. COOPERSTOWN, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	5.54	4.76	2.60	2.22	2.16	1.98	5.02	4.26	1.41	3.01	3.15	4.96	41.07
1892	4.99	2.23	3.43	1.38	7.82	4.86	7.80	7.96	3.57	1.79	3.19	1.53	50.55
1893	1.89	4.99	2.13	2.96	6.74	2.20	4.85	7.59	4.03	1.27	2.20	4.02	44.87
1894	2.84	2.09	1.92	2.54	5.29	2.62	3.41	1.88	5.55	4.73	2.72	2.33	37.92
1895	2.34	1.43	1.93	2.89	2.44	2.18	3.80	7.15	2.86	2.17	3.65	3.89	36.73
1896	1.48	5.36	4.74	1.25	2.33	4.70	4.60	3.49	4.33	2.23	3.56	1.21	39.28
1897	1.72	2.06	3.31	3.65	5.21	5.22	4.86	6.60	3.40	.64	5.21	4.64	46.52
1898	4.90	2.93	2.14	4.00	4.70	3.80	3.02	9.75	4.20	5.36	4.64	2.44	51.88
1899	2.22	2.31	6.04	1.87	4.52	2.85	3.92	2.72	3.17	2.25	1.93	4.10	37.90
1900	3.08	5.59	2.91	1.94	1.98	3.03	6.61	4.62	1.92	2.57	4.62	2.59	41.46
1901	2.47	1.12	3.00	4.73	4.94	3.65	6.79	5.96	3.08	2.48	2.74	4.85	45.81
1902	1.04	2.89	3.70	3.10	2.76	5.43	9.17	3.05	4.39	4.00	1.48	4.30	45.31
1903	3.30	3.61	5.84	1.57	.17	7.35	5.52	7.26	1.64	8.32	2.21	2.66	49.45
1904	4.29	3.00	3.06	2.84	2.40	4.00	4.74	4.55	4.08	3.49	1.18	2.49	40.12
Mean	3.01	3.17	3.34	2.64	3.82	3.85	5.29	5.49	3.40	3.16	3.03	3.29	43.49

3. BOUCKVILLE, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	2.43	2.19	4.80	2.20	3.35	3.08	2.86	1.97	2.28	2.53	2.85	3.25	33.79
1900	3.82	2.60	6.73	1.21	1.93	2.21	5.09	3.32	1.21	3.60	6.03	3.72	41.47
1901	3.85	3.30	3.18	3.87	5.79	4.14	3.54	3.44	2.30	2.38	3.74	4.50	44.03
1902	1.88	[4.61]	[3.70]	[1.56]	[3.53]	[6.25]	[7.25]	[3.13]	[2.99]	[5.59]	[1.53]	[5.37]	[47.39]
1903	3.60	3.03	4.70	1.80	.00	10.25	2.49	5.91	1.66	8.09	2.32	4.72	48.57
1904	5.39	3.24	2.68	3.80	2.49	2.35	8.85	4.79	3.28	3.06	1.11	3.88	44.92
Mean	3.50	3.16	4.30	2.41	2.85	4.71	5.01	3.76	2.29	4.21	2.93	4.24	43.37

[a] The numbers indicate locations on map, fig. 1, p. 11.
[] Interpolated.

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

4. NEW LISBON, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	4.11	3.56	2.09	1.89	2.50	3.72	4.63	5.59	1.39	3.26	2.25	4.78	39.77
1892	4.40	1.52	3.44	1.25	7.27	3.86	6.23	8.70	2.76	1.61	3.63	1.00	45.67
1893	1.65	4.86	2.12	3.30	4.90	1.97	5.13	8.38	4.05	1.25	.95	2.38	40.94
1894	2.13	1.75	1.40	1.50	4.82	3.88	2.13	2.04	5.74	4.67	2.00	1.92	33.98
1895	2.03	1.98	1.41	3.21	2.50	2.00	2.53	5.76	2.16	1.45	2.98	4.04	32.05
1896	.86	4.31	3.96	.80	2.42	3.77	5.12	2.45	5.07	2.09	2.96	.95	34.76
1897	1.14	1.53	2.90	2.63	4.40	4.10	5.58	3.17	3.19	.73	4.04	4.20	37.61
1898	4.37	2.13	1.68	2.77	3.92	3.04	6.50	7.38	4.95	7.19	3.64	1.48	49.05
1899	1.46	1.96	4.49	2.04	3.44	3.67	3.19	3.49	3.25	1.70	1.93	3.17	33.79
1900	2.04	3.29	3.82	1.30	1.63	2.98	7.27	3.50	2.33	2.87	3.89	2.54	37.46
1901	1.27	.83	2.78	3.38	5.51	4.21	3.68	5.60	3.60	1.54	2.08	4.53	39.01
1902	1.00	2.81	4.13	1.72	2.94	4.61	10.08	3.93	3.05	4.11	1.12	5.55	45.05
1903	2.88	3.19	5.77	1.26	.25	7.04	5.24	6.54	1.57	7.36	2.04	3.35	46.49
1904	3.73	1.75	2.98	2.59	2.62	4.60	5.92	4.41	4.51	3.09	1.86	2.08	40.14
Mean	2.36	2.53	3.07	2.12	3.51	3.82	5.23	5.07	3.40	3.07	2.53	3.00	39.71

5. ONEONTA, N. Y.

1899	2.33	2.60	5.51	0.81	2.79	4.82	4.05	2.72	4.96	1.77	1.70	3.53	37.59
1900	2.63	[2.44]	2.23	1.35	1.26	3.41	5.14	6.24	2.44	3.07	2.65	2.06	34.92
1901	1.80	.92	2.41	3.93	4.54	[5.00]	3.85	4.45	3.34	2.64	2.15	4.36	39.39
1902	1.09	2.97	3.45	1.30	2.82	4.96	7.71	2.54	2.59	4.91	1.11	4.61	40.06
1903	2.46	3.29	5.90	1.05	.36	6.83	4.81	7.70	1.44	7.9[illegible]	2.31	2.36	46.48
1904	3.57	2.80	5.28	3.59	2.82	2.71	5.20	7.13	4.66	4.45	2.07	2.64	46.92
Mean	2.31	2.50	4.13	2.00	2.43	4.62	5.13	5.13	3.24	4.14	2.00	3.26	40.89

6. SOUTH KORTRIGHT, N. Y.

1891	4.67	3.31	2.37	1.65	3.57	3.04	3.67	4.21	1.45	[2.70]	2.63	4.57	[37.84]
1892	3.30	1.20	2.32	.77	6.35	2.80	5.14	6.55	2.98	1.13	2.61	1.11	36.26
1893	1.27	4.22	2.82	3.35	5.81	5.76	3.50	7.26	3.76	2.05	1.10	1.99	42.89
1894	2.28	1.19	1.25	2.25	6.67	4.16	4.10	.84	3.08	4.04	2.30	3.08	35.24
1895	1.76	1.40	1.69	3.31	2.10	1.53	3.11	4.68	2.69	2.71	3.70	3.23	31.91
1896	[2.19]	4.81	3.76	1.48	2.94	2.75	5.50	2.12	3.68	2.35	2.83	1.37	35.78
1897	.94	1.53	2.59	2.91	5.33	5.00	5.56	6.03	4.67	.98	4.35	4.02	43.91
1898	2.84	2.38	1.82	2.54	4.06	3.70	2.56	8.21	2.98	5.23	3.88	1.87	42.07
1899	1.35	2.35	3.53	1.79	2.81	4.24	4.31	2.19	4.89	.90	1.43	2.44	32.23
1900	1.91	3.55	2.31	1.71	1.66	4.74	2.84	3.18	2.50	2.09	2.37	[3.07]	31.93
1901	1.84	1.23	3.64	3.06	4.97	[4.37]	[4.17]	3.87	4.25	3.87	2.57	5.75	43.59
1902	1.61	3.56	3.28	3.30	2.48	8.41	6.39	3.55	5.24	5.11	.81	4.11	47.85
1903	2.55	3.31	4.74	1.71	.25	6.21	3.39	5.44	1.64	8.30	2.23	3.25	43.02
1904	2.87	1.67	2.75	1.99	2.19	1.73	4.54	6.33	4.34	4.61	1.98	1.87	36.37
Mean	2.21	2.55	2.78	2.27	3.66	4.17	4.20	4.60	3.44	3.29	2.48	2.98	38.63

7. OXFORD, N. Y.

1891	4.83	4.15	2.78	2.44	1.39	5.44	4.27	6.02	2.72	4.42	2.65	5.38	46.49
1892	6.47	1.66	4.87	1.74	9.37	4.12	5.62	7.90	2.50	1.62	3.44	1.27	50.58
1893	2.57	4.47	2.58	4.89	6.23	3.70	6.01	7.37	3.94	1.46	1.72	3.28	48.22
1894	2.85	2.46	1.86	2.79	5.03	4.02	2.73	2.36	6.11	5.97	2.58	2.60	41.36
1895	3.46	2.00	2.13	2.76	2.78	1.74	2.48	4.59	2.64	1.06	3.95	4.23	33.82
1896	1.99	4.97	5.56	.77	3.53	2.96	5.37	2.71	2.17	2.69	2.66	1.72	37.10
1897	1.76	2.09	4.08	3.76	5.47	4.80	8.04	2.68	3.13	.80	4.85	4.01	45.47
1898	4.76	3.11	2.75	4.90	3.90	3.58	3.41	9.82	4.99	7.08	4.58	3.35	56.23
1899	2.22	3.29	5.44	1.70	3.43	4.30	5.22	3.20	3.05	2.52	2.03	3.54	39.94
1900	3.19	4.76	5.31	1.70	2.00	3.77	3.72	2.89	2.53	3.62	5.31	3.43	42.23
1901	2.89	2.05	3.70	3.33	7.69	2.96	3.93	4.33	3.61	3.04	3.12	6.21	46.86
1902	1.82	4.02	4.32	1.78	2.73	6.46	8.65	2.62	3.97	4.80	1.25	6.11	48.53
1903	3.92	2.99	5.64	1.69	.42	7.56	3.98	7.89	1.52	7.06	1.88	5.53	50.08
1904	4.63	2.85	3.72	3.09	3.06	1.22	5.98	4.49	5.25	3.06	1.50	3.75	42.60
Mean	3.38	3.20	3.91	2.67	4.07	4.04	4.96	4.92	3.44	3.51	2.97	3.89	44.96

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

8. CORTLAND, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	1.88	0.69	1.83	0.56	2.50	2.25	4.69	2.64	2.40	2.99	2.99	3.98	29.40
1900	3.28	1.84	1.49	1.56	1.17	2.40	4.78	1.92	2.00	4.59	7.17	2.58	34.78
1901	1.22	1.44	2.76	3.31	3.25	2.96	3.49	3.83	2.90	1.02	3.47	6.41	36.06
1902	1.25	1.35	3.20	1.21	2.79	5.03	10.12	3.68	2.51	3.59	1.07	4.78	40.58
1903	1.70	1.71	5.13	1.12	[2.43]	6.12	3.99	8.21	2.07	11.47	2.24	1.62	47.81
1904	3.62	2.10	2.85	[1.55]	4.03	2.57	7.55	4.50	5.02	3.29	.84	2.68	40.60
Mean	2.16	1.52	2.88	1.55	2.70	3.55	5.77	4.13	2.82	4.49	2.96	3.68	38.21

9. BINGHAMTON, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	3.30	3.27	4.46	2.16	1.16	3.55	3.30	6.59	1.54	4.24	2.65	3.24	39.46
1892	4.21	1.90	3.98	1.13	6.08	5.43	2.92	6.04	1.33	1.54	2.65	1.27	38.48
1893	2.42	4.16	2.80	3.36	5.16	2.58	4.10	4.88	4.50	1.68	1.38	2.91	39.93
1894	2.18	2.98	1.51	3.53	5.34	1.97	2.88	1.47	4.98	5.62	1.98	3.31	37.75
1895	3.18	1.60	1.58	2.29	2.92	2.05	4.06	3.39	2.11	.82	2.94	3.63	30.57
1896	2.25	4.28	4.68	.63	3.11	2.64	3.85	1.42	4.62	3.68	2.66	1.20	35.02
1897	1.12	1.37	2.66	1.98	4.01	2.98	2.30	1.37	3.03	.66	2.43	3.23	27.14
1898	2.86	2.51	2.31	2.79	4.02	2.16	2.05	6.48	2.70	5.79	3.15	1.45	38.27
1899	1.79	2.63	2.84	.96	2.43	2.15	1.84	2.44	1.45	1.12	1.83	2.02	23.50
1900	1.59	2.65	3.17	1.35	.53	1.54	2.29	.67	2.10	2.05	3.08	1.40	22.42
1901	.76	1.09	2.95	4.20	5.49	1.77	3.47	3.76	3.10	1.46	2.31	5.41	35.77
1902	1.13	2.31	3.54	1.49	1.93	6.84	5.51	2.13	4.75	3.08	1.07	2.92	36.70
1903	2.41	2.24	3.84	1.57	.42	5.79	2.67	6.85	1.21	5.74	2.26	2.12	37.12
1904	2.11	1.16	2.11	2.51	2.66	2.76	4.73	3.12	[2.88]	3.31	.49	1.12	28.96
Mean	2.24	2.44	3.03	2.14	3.23	3.16	3.28	3.62	2.88	2.91	2.21	2.52	33.66

10. PERRY CITY, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	3.34	4.23	3.45	2.16	0.74	4.13	3.54	3.90	0.98	5.46	2.19	4.48	38.60
1892	4.56	1.54	3.95	1.65	6.08	6.65	6.86	4.12	.84	1.64	4.63	.78	43.30
1893	1.75	2.80	2.43	3.58	5.37	2.13	4.99	5.21	4.12	2.74	.91	1.87	37.90
1894	3.13	2.54	.99	6.10	6.55	4.05	2.86	1.38	5.46	4.33	2.10	3.06	42.55
1895	2.82	1.40	2.06	1.37	2.49	3.54	2.72	4.67	2.00	.91	4.16	3.08	31.22
1896	1.68	3.58	3.70	1.58	3.81	3.67	4.18	2.54	3.97	4.07	2.44	1.40	36.62
1897	1.81	1.33	2.66	2.56	3.69	4.18	3.55	2.30	2.58	.86	3.74	2.86	32.12
1898	2.47	1.68	1.85	3.64	3.36	3.47	1.82	4.68	2.12	6.26	3.90	2.35	37.60
1899	2.03	1.42	2.93	1.46	2.73	2.38	4.30	.96	2.42	3.22	3.34	3.02	30.21
1900	2.52	3.84	3.64	2.00	2.29	1.51	2.66	2.48	1.07	4.76	6.58	2.42	35.77
1901	2.10	1.42	3.12	4.85	4.80	2.85	5.39	7.37	2.22	.86	3.36	5.28	43.62
1902	2.18	1.46	2.28	1.67	2.14	5.52	9.46	4.82	2.40	4.03	1.20	3.69	40.85
1903	2.28	2.03	5.34	1.86	.72	7.04	4.94	8.60	.99	5.79	2.56	1.52	43.67
1904	2.70	1.83	2.92	3.54	5.61	2.01	5.48	3.10	2.80	3.82	1.07	1.80	36.68
Mean	2.53	2.22	2.95	2.72	3.60	3.80	4.48	4.01	2.43	3.48	3.01	2.69	37.92

11. WEDGWOOD, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	2.48	3.88	3.11	2.46	0.89	2.43	2.45	4.58	0.66	4.19	1.77	3.85	32.75
1892	3.50	2.50	3.81	1.08	5.17	4.35	7.24	4.02	.75	2.20	3.25	.71	38.58
1893	2.23	2.49	2.93	3.55	5.37	5.51	3.55	5.61	2.83	2.57	1.60	1.71	39.95
1894	3.10	3.09	1.00	6.67	8.01	2.59	2.49	1.41	5.91	4.22	1.86	3.15	43.50
1895	2.30	.85	1.00	1.55	2.71	4.03	2 31	8.27	1.32	1.02	3.37	3.51	32.24
1896	1.72	5.02	3.43	2.52	2.98	6.23	5.02	1.54	5.02	4.42	2.03	1.42	41.35
1897	1.85	.87	2.54	2.72	3.72	2.74	3.43	3.04	2.66	.74	3.20	1.93	29.44
1898	2.73	1.88	2.62	2.91	3.40	2.72	3.48	4.73	1.86	5.95	2.73	1.98	36.99
1899	1.72	2.07	2.80	1.03	2.04	2.11	3.77	2.55	2.48	2.62	3.50	2.90	29.59
1900	2.56	2.57	3.74	1.80	2.72	1.91	3.19	1.71	.90	5.33	6.79	2.53	35.75
1901	2.05	1.37	3.32	5.44	4.82	4.09	2.84	9.42	2.46	.81	2.90	5.29	44.81
1902	2.04	2.02	2.87	2.96	2.33	6.25	9.23	3.70	2.73	3.41	1.24	3.25	42.03
1903	3.29	2.25	5.42	2.06	.87	5.53	3.26	10.34	1.51	5.05	1.81	1.93	43.32
1904	3.68	1.77	3.12	3.87	5.31	3.39	4.79	4.85	2.13	2.02	.62	1.87	37.42
Mean	2.52	2.33	2.98	2.90	3.60	3.85	4.08	4.70	2.37	3.18	2.62	2.57	37.70

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

12. ATLANTA, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	1.31	1.54	2.45	1.51	2.85	1.18	2.10	3.14	2.54	1.91	2.38	3.57	26.48
1900	2.64	3.00	4.04	2.08	1.77	2.17	3.08	2.41	1.07	3.79	5.89	1.87	33.81
1901	2.18	2.54	2.60	5.97	5.97	2.10	7.59	9.08	2.58	1.31	2.99	4.82	49.73
1902	2.83	1.94	2.27	3.60	2.97	5.19	10.21	1.93	2.83	3.25	1.39	2.59	41.00
1903	2.41	2.46	5.02	2.92	1.16	4.66	4.27	5.58	2.06	3.86	1.84	1.67	37.91
1904	4.56	2.39	3.59	2.99	4.39	4.31	6.35	3.08	3.69	2.79	.98	2.05	41.17
Mean	2.66	2.31	3.33	3.18	3.18	3.27	5.60	4.20	2.46	2.82	2.58	2.76	38.35

13. ANGELICA, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	2.04	1.64	2.72	0.90	2.39	1.81	2.56	2.05	2.86	2.99	2.09	3.97	28.02
1900	2.61	2.33	3.76	1.44	2.62	2.56	4.04	2.59	1.47	4.52	5.40	2.15	35.49
1901	2.62	2.04	2.95	5.29	5.23	3.69	3.34	4.87	3.11	1.15	2.88	4.77	41.94
1902	2.80	1.80	2.53	3.76	3.97	5.79	12.46	3.35	4.46	2.06	.79	1.95	45.72
1903	1.78	1.45	4.60	2.65	1.16	4.54	4.11	7.51	1.80	[2.68]	2.57	.77	35.62
1904	2.69	1.48	2.47	1.97	4.00	[3.68]	6.54	[4.07]	[2.74]	[2.68]	[2.75]	[2.72]	[37.79]
Mean	2.42	1.79	3.17	2.67	3.23	3.68	5.51	4.07	2.74	2.68	2.75	2.72	37.43

14. SOUTH CANISTEO, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	2.53	4.72	3.43	2.22	1.41	2.68	4.62	5.80	1.20	3.48	2.74	3.30	38.13
1892	3.50	3.40	3.42	1.57	6.74	3.99	4.56	4.83	1.40	2.44	3.60	1.01	40.46
1893	2.96	3.58	3.51	5.84	5.25	4.78	2.70	4.13	2.76	4.05	2.03	2.91	44.50
1894	3.41	3.21	1.64	7.80	11.46	3.51	3.34	2.71	7.12	4.40	2.13	3.41	54.14
1895	3.32	.97	1.63	1.49	2.79	4.75	2.77	3.88	1.15	1.17	3.39	4.34	31.65
1896	2.76	5.62	3.62	1.25	4.03	6.22	5.01	1.62	5.10	6.49	1.82	1.14	44.68
1897	2.34	1.60	3.01	3.13	3.18	3.48	5.62	2.69	3.47	1.04	3.56	2.71	35.83
1898	3.90	2.09	4.53	3.35	3.87	2.90	1.75	4.45	2.28	4.80	3.33	2.62	39.87
1899	1.99	1.95	2.60	1.51	3.29	2.48	2.99	1.99	3.15	3.21	1.80	4.27	31.23
1900	2.40	5.62	2.62	1.60	3.05	5.11	4.10	3.37	1.43	5.81	6.03	1.60	42.74
1901	1.95	1.32	3.13	7.07	5.15	3.53	3.97	5.93	3.24	.62	2.64	4.66	43.21
1902	2.90	2.37	2.73	2.86	1.77	6.24	8.40	2.56	3.32	1.49	1.41	3.05	39.10
1903	3.25	2.15	4.64	3.24	1.94	5.49	4.59	7.13	1.98	4.47	2.48	1.38	42.74
1904	3.45	3.85	3.15	2.81	5.06	2.03	4.20	3.80	3.01	2.46	1.05	2.10	36.97
Mean	2.90	3.03	3.12	3.27	4.21	4.09	4.18	3.92	2.90	3.28	2.72	2.75	40.37

15. ADDISON, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	1.84	2.89	2.12	1.44	0.32	2.05	2.91	4.24	0.49	2.94	1.64	2.96	25.84
1892	2.97	1.58	3.68	.94	5.85	3.18	4.94	3.62	.91	1.50	3.46	.48	33.11
1893	1.64	2.27	2.62	3.50	7.87	3.04	2.37	3.69	2.34	2.89	1.22	1.88	35.33
1894	1.94	1.89	1.06	6.60	9.70	1.82	2.06	1.44	5.62	4.03	1.42	2.93	40.51
1895	3.11	1.12	.88	1.31	2.11	4.15	2.02	3.82	1.22	.80	2.44	2.92	25.90
1896	1.47	3.18	3.05	1.07	4.50	5.78	4.45	.77	3.67	5.73	.83	.88	35.38
1897	1.54	.76	2.29	2.41	4.26	2.56	4.52	2.05	2.90	.94	3.10	1.91	29.24
1898	3.91	1.80	2.30	2.51	4.12	3.67	2.16	2.92	1.31	5.99	2.13	2.15	34.97
1899	1.87	1.49	2.24	1.17	2.88	2.96	3.31	2.90	4.25	1.93	3.58	3.04	31.62
1900	1.92	2.15	2.86	1.49	2.92	2.86	1.93	2.39	1.01	4.80	6.00	1.66	31.99
1901	1.23	.71	3.06	5.82	4.94	2.14	2.01	6.22	2.55	.93	2.00	4.86	36.47
1902	2.30	1.42	2.57	2.41	2.26	5.37	6.85	2.91	3.55	2.84	.89	2.50	35.87
1903	1.87	1.81	4.56	2.67	1.90	5.90	5.51	7.25	1.81	4.42	1.84	.79	40.33
1904	2.47	1.56	2.79	2.27	4.44	1.94	4.53	3.76	2.63	1.57	.56	1.13	29.65
Mean	2.15	1.76	2.58	2.54	4.15	3.39	3.54	3.43	2.45	2.95	2.22	2.15	33.31

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

16. ELMIRA, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	2.33	2.19	1.98	1.73	0.50	4.57	2.13	3.72	3.25	[4.30]	[1.80]	[3.80]	32.30
1892	3.01	[1.76]	2.96	1.01	5.30	4.11	3.39	3.28	1.18	1.30	[2.10]	[2.31]	31.71
1893	.62	1.61	2.05	3.55	6.84	3.62	3.89	5.54	3.72	2.66	[2.10]	[2.31]	38.51
1894	2.73	1.89	1.05	4.42	7.65	1.94	1.62	1.23	5.16	4.21	1.28	2.89	36.07
1895	2.70	1.20	1.37	1.56	3.03	3.51	2.34	4.04	1.89	.78	1.25	2.70	26.37
1896	1.56	3.40	3.22	.77	3.14	3.31	5.55	.94	2.73	4.86	1.40	.61	31.49
1897	1.40	.93	2.41	2.30	5.56	1.76	3.23	3.70	3.70	.65	2.89	1.60	30.13
1898	2.45	1.45	2.53	2.84	4.29	3.43	2.24	4.70	1.78	4.49	2.24	2.25	34.69
1899	1.51	1.65	2.94	1.52	2.52	2.84	2.69	3.16	3.23	3.07	1.68	1.82	28.63
1900	[1.95]	2.26	3.35	1.58	1.43	1.82	3.48	1.25	1.16	4.19	5.09	1.72	29.28
1901	1.09	.59	2.84	5.56	4.82	1.84	4.23	4.07	2.86	.93	2.75	5.22	36.80
1902	1.93	1.46	2.63	1.71	2.02	4.12	7.84	2.91	3.53	3.30	.88	1.96	34.29
1903	2.08	2.50	4.25	2.24	1.52	7.18	4.78	6.28	1.47	5.10	1.87	.81	40.08
1904	3.18	2.21	2.52	2.77	5.00	4.56	3.80	3.61	3.52	2.01	.57	1.15	34.90
Mean	2.04	1.79	2.58	2.40	3.83	3.47	3.66	3.46	2.80	2.99	1.99	2.22	33.23

17. WAVERLY, N. Y.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	1.77	2.26	2.88	1.23	3.26	2.77	4.08	5.23	2.40	1.53	3.37	2.48	33.26
1900	2.00	3.35	4.08	1.58	1.11	2.75	3.07	1.64	1.12	3.72	5.20	2.76	32.38
1901	1.22	.86	4.42	5.87	5.96	2.59	3.35	5.83	2.59	1.42	3.47	6.61	44.19
1902	2.48	2.20	4.56	2.76	1.97	5.50	7.29	2.36	3.98	3.46	1.05	3.19	40.80
1903	2.52	2.23	4.27	2.25	.76	6.67	3.87	6.52	1.85	5.60	2.30	1.49	40.33
1904	3.47	1.53	3.67	2.57	4.02	3.33	2.70	3.31	3.38	2.08	.69	1.81	32.56
Mean	2.24	2.07	3.98	2.71	2.85	3.94	4.06	4.15	2.55	2.97	2.68	3.06	37.26

18. ATHENS, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	2.53	2.84	2.75	1.41	3.15	1.93	3.90	4.32	2.49	1.38	3.26	2.57	32.53
1900	1.59	2.84	3.39	1.73	1.26	2.16	2.70	1.48	1.15	3.10	4.60	2.14	28.14
1901	.74	.45	3.82	5.40	5.14	4.11	3.32	4.79	2.33	1.48	3.10	4.47	39.15
1902	2.05	1.89	3.41	2.71	1.65	5.18	5.68	2.17	4.01	3.08	1.11	2.93	35.87
1903	2.60	2.54	4.33	[2.81]	2.00	5.42	3.57	5.79	1.71	5.91	2.40	1.42	40.50
1904	3.02	1.15	(a)	------	------	------	------	------	------	------	------	------	--------
Mean	2.09	1.95	3.54	2.81	2.64	3.76	3.83	3.71	2.34	2.99	2.89	2.71	35.24

19. LAWRENCEVILLE, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	1.85	2.22	2.28	2.10	2.81	3.78	3.15	6.06	3.03	0.41	3.46	2.60	33.75
1900	3.48	5.10	[3.18]	1.11	2.47	2.02	3.50	2.05	.95	4.85	6.36	1.60	36.67
1901	1.60	.90	3.45	5.64	3.90	1.61	2.99	5.08	2.05	1.54	2.78	6.22	37.76
1902	1.75	1.95	2.30	2.70	2.16	5.54	7.37	2.14	4.30	2.22	1.19	3.21	36.83
1903	2.62	2.33	4.67	2.67	1.65	8.60	5.60	5.31	1.99	5.10	2.85	1.92	45.31
1904	3.08	3.06	2.60	2.95	4.32	3.04	3.78	2.68	2.30	2.24	.40	1.60	32.05
Mean	2.40	2.59	3.08	2.86	2.88	4.10	4.40	3.89	2.44	2.73	2.84	2.86	37.07

a No record.

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

20. WELLSBORO, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	6.53	3.46	2.72	1.07	1.30	4.07	3.43	3.57	2.30	2.44	4.11	4.01	39.01
1892	3.67	2.21	4.56	.61	6.69	8.84	2.15	4.73	1.18	.33	2.55	.40	37.92
1893	4.92	6.55	5.09	5.38	6.58	1.42	2.50	4.59	2.03	2.88	3.00	4.21	49.15
1894	2.25	2.25	.24	8.69	10.23	1.89	3.88	2.05	5.85	3.81	3.06	4.07	48.27
1895	3.00	.85	2.90	2.21	6.44	3.50	3.22	4.65	1.12	1.62	2.67	6.55	38.73
1896	1.50	4.34	3.00	.91	1.87	3.92	5.67	.88	3.03	5.40	.82	.95	32.29
1897	2.23	2.30	3.55	2.55	5.53	2.85	5.46	1.84	3.40	.67	5.21	3.09	38.68
1898	1.72	1.33	4.78	4.43	4.70	2.70	2.04	5.13	2.24	8.62	2.83	2.68	43.20
1899	3.42	2.54	2.75	3.07	2.15	4.09	3.37	3.49	2.97	2.63	2.90	3.78	37.16
1900	3.04	4.90	2.90	1.22	2.50	2.90	2.90	3.67	.55	5.01	6.11	.97	36.67
1901	1.27	.80	2.53	4.46	4.23	4.17	2.27	5.04	2.14	.39	3.59	5.66	36.55
1902	1.54	2.70	2.67	2.86	2.05	6.17	9.48	1.29	3.32	2.14	.50	5.18	39.90
1903	1.86	3.55	5.19	2.76	2.12	4.87	5.27	3.37	1.10	5.68	2.42	1.35	39.54
1904	2.95	(a)	------	------	------	------	------	------	------	------	------	------	--------
Mean	2.85	2.91	3.30	3.09	4.34	3.95	3.97	3.41	2.40	3.20	3.06	3.30	39.77

21. LEROY, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	4.63	3.13	3.15	2.01	1.18	4.75	3.05	4.33	2.00	4.25	3.24	4.34	40.06
1892	4.60	1.09	4.25	.96	5.14	7.97	2.39	4.04	2.04	.91	3.22	.93	37.54
1893	2.59	3.86	3.10	4.19	7.76	1.96	2.18	5.92	2.70	3.91	2.07	2.71	42.95
1894	2.43	3.04	1.00	6.12	8.35	1.64	2.98	1.23	5.44	5.29	2.47	3.39	43.38
1895	3.27	.80	1.55	2.65	3.24	3.69	3.42	3.81	3.11	.65	3.06	4.05	33.30
1896	2.00	4.66	4.58	1.44	2.46	2.66	5.84	2.22	3.87	5.04	2.92	.79	38.48
1897	2.13	2.28	2.55	2.70	4.84	3.77	3.95	4.40	3.08	1.30	3.81	2.89	37.70
1898	3.30	2.05	3.39	4.61	3.65	2.75	3.06	6.95	.81	5.37	2.62	1.58	40.14
1899	2.19	3.05	3.02	2.15	2.07	4.90	1.93	6.84	2.85	1.34	3.64	4.47	38.45
1900	1.94	3.07	5.45	1.34	1.50	3.40	4.06	2.14	.54	3.88	4.71	2.12	34.15
1901	.99	.75	4.21	4.68	5.34	3.44	3.22	5.40	3.70	1.16	2.83	8.26	43.98
1902	2.59	3.02	4.76	3.16	1.47	5.40	9.46	4.31	4.67	3.29	.90	3.46	46.49
1903	2.95	3.00	4.37	2.97	2.00	5.13	4.17	4.40	1.57	5.08	2.76	2.60	41.00
1904	2.83	1.13	3.94	3.15	5.45	3.50	2.21	4.80	3.53	2.58	.65	1.65	35.42
Mean	2.75	2.50	3.52	3.01	3.89	3.93	3.71	4.34	2.85	3.15	2.78	3.20	39.52

22. TOWANDA, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	1.80	2.52	2.55	1.84	2.10	4.52	2.47	5.43	2.03	1.21	3.39	2.82	32.68
1900	1.36	2.90	3.48	1.31	1.38	3.49	3.49	3.44	.69	2.83	3.53	1.99	29.89
1901	.91	.45	3.92	4.65	7.58	4.26	3.51	4.79	3.95	1.31	2.43	6.00	43.76
1902	1.72	3.35	4.07	2.36	1.06	4.86	7.77	2.02	4.58	3.35	1.11	2.95	39.20
1903	2.62	2.73	3.83	2.37	.89	5.05	4.85	4.63	1.24	4.98	2.66	2.42	38.27
1904	2.72	1.06	2.73	2.48	4.89	5.03	3.96	4.32	4.70	2.18	.69	1.59	36.35
Mean	1.86	2.17	3.43	2.50	2.98	4.54	4.34	4.10	2.86	2.64	2.30	2.96	36.68

23. DUSHORE, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	1.94	3.48	3.79	1.82	2.20	3.13	2.03	3.79	2.80	1.36	2.84	5.09	34.27
1900	1.97	4.01	3.19	1.05	2.31	4.10	4.68	2.25	1.13	2.35	3.38	2.09	32.51
1901	1.10	.78	4.37	5.50	6.90	3.34	5.34	10.59	3.33	2.71	2.87	7.13	53.96
1902	2.58	4.45	5.66	3.91	1.16	7.39	8.95	3.28	5.29	3.37	1.20	4.65	51.89
1903	2.61	4.02	3.36	2.66	1.25	5.34	5.05	5.29	1.52	4.98	2.38	3.48	41.94
1904	3.34	.99	3.26	2.68	4.94	[4.66]	2.98	3.95	3.18	2.15	.97	2.19	35.29
Mean	2.26	2.96	3.94	2.94	3.13	4.66	4.84	4.86	2.88	2.82	2.27	4.10	41.66

a No record.

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

24. SOUTH EATON, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	5.47	3.48	4.54	2.85	1.06	2.17	4.88	4.15	1.35	3.71	2.84	3.88	40.38
1892	5.38	.91	4.53	1.20	5.49	4.50	3.14	2.85	2.97	.77	2.88	.86	35.48
1893	2.69	5.49	3.03	3.53	5.12	2.98	3.83	5.41	2.21	1.88	1.94	2.46	40.57
1894	1.65	2.79	.80	2.76	7.26	1.09	1.98	2.22	3.69	6.50	2.27	3.41	36.42
1895	2.35	1.33	1.62	3.60	3.40	4.50	2.81	2.07	1.68	2.26	2.44	4.26	32.32
1896	10.52	4.11	4.45	1.13	2.86	2.62	4.66	3.06	2.45	4.94	4.16	1.11	46.07
1897	1.89	2.49	2.40	3.11	5.29	3.92	3.38	3.23	2.24	1.12	3.96	4.13	37.16
1898	3.93	1.43	3.16	2.73	3.67	1.63	1.64	6.30	1.90	4.49	3.27	2.02	36.17
1899	1.98	3.58	3.96	2.30	2.24	2.58	2.39	3.38	2.16	1.16	2.71	2.81	31.25
1900	2.10	3.47	3.75	.97	1.97	3.52	4.09	1.93	1.84	1.98	3.21	2.17	31.00
1901	.92	.81	3.73	4.21	6.70	3.01	5.32	5.76	2.66	1.94	1.69	6.16	42.91
1902	1.42	5.26	4.06	2.22	1.34	6.61	5.41	2.27	8.15	7.05	1.00	6.09	50.88
1903	2.78	4.53	4.83	3.29	1.31	6.74	3.86	6.19	1.93	5.23	2.09	3.85	46.63
1904	2.97	1.67	2.56	3.21	3.00	3.74	5.94	3.40	3.71	3.54	1.06	1.90	36.70
Mean	3.29	2.95	3.39	2.65	3.62	3.54	3.81	3.73	2.78	3.33	2.54	3.22	38.85

25. SCRANTON, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	3.03	6.30	4.46	1.96	2.73	2.66	4.73	3.62	3.47	0.63	2.11	2.10	37.80
1900	2.13	2.75	2.98	1.81	2.81	3.54	4.63	1.27	1.72	2.66	2.37	2.61	31.28
1901	1.17	1.34	3.23	3.44	5.58	1.82	4.12	6.88	2.35	1.11	2.58	5.64	39.26
1902	2.14	4.73	3.14	2.27	1.61	6.69	4.60	3.28	6.23	4.94	1.06	4.36	45.05
1903	2.73	3.54	4.40	2.55	.96	7.73	4.89	6.03	1.27	6.42	1.86	2.59	44.97
1904	3.23	.92	2.10	2.32	2.17	3.46	5.94	4.69	3.33	3.80	1.51	3.71	37.18
Mean	2.40	3.26	3.38	2.39	2.64	4.32	4.82	4.30	3.06	3.26	1.92	3.50	39.25

26. WILKESBARRE, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	4.59	4.00	3.67	2.28	1.53	2.88	4.48	3.46	1.80	1.63	2.54	4.38	37.24
1892	7.02	1.11	6.41	1.55	5.89	10.55	4.71	5.56	2.51	.72	4.37	1.53	51.93
1893	3.34	7.23	3.83	3.27	4.15	1.43	3.00	3.76	3.74	1.70	2.97	4.07	42.49
1894	1.63	4.50	1.68	3.41	8.56	1.78	.74	1.14	5.05	5.53	2.29	3.66	39.97
1895	3.43	2.32	2.94	2.71	4.16	2.89	2.59	4.97	1.59	2.51	1.37	4.13	35.61
1896	1.14	6.17	6.31	1.06	3.17	2.40	6.20	2.99	2.26	2.74	3.44	1.08	38.96
1897	1.40	2.06	3.78	3.34	5.81	3.72	3.76	2.57	1.49	1.47	4.35	3.80	37.55
1898	2.90	.96	2.76	2.46	6.04	3.29	2.33	5.16	3.44	2.36	3.90	1.95	37.55
1899	3.21	4.48	4.49	1.37	2.07	2.82	3.91	2.67	4.29	1.29	2.70	1.72	35.02
1900	1.98	3.21	2.91	1.01	3.81	3.39	5.74	3.16	.52	2.59	3.05	3.02	34.39
1901	2.10	.75	3.81	3.11	5.36	2.48	2.74	7.23	1.64	2.55	1.23	5.98	38.98
1902	2.23	5.60	3.19	1.58	.98	6.10	5.01	1.89	6.82	4.29	1.14	4.95	43.78
1903	2.09	4.13	4.33	3.07	1.12	8.38	4.42	7.13	2.16	4.88	1.98	3.06	46.75
1904	2.86	1.59	3.62	2.34	2.15	2.95	5.83	5.58	3.34	3.68	1.18	3.38	38.50
Mean	2.85	3.44	3.84	2.33	3.91	3.93	3.96	4.09	2.90	2.71	2.61	3.34	39.91

27 WILLIAMSPORT, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	1.46	3.71	4.36	1.71	2.36	4.25	2.00	4.15	2.94	3.26	2.13	4.63	36.96
1900	2.31	3.72	3.63	.81	2.35	2.89	2.57	2.89	1.01	2.35	3.26	2.15	29.94
1901	1.40	.66	3.63	5.57	6.34	2.99	3.29	5.18	3.21	1.59	2.59	5.86	42.31
1902	3.61	4.81	4.05	2.43	1.45	5.61	6.02	1.69	5.65	2.10	1.31	3.74	42.47
1903	3.44	3.24	3.96	3.67	1.88	5.49	6.08	5.05	1.43	4.22	2.33	2.85	43.64
1904	3.64	1.10	5.11	3.63	5.28	3.07	5.59	2.13	2.60	2.24	.51	2.63	37.53
Mean	2.64	2.87	4.12	2.97	3.28	4.05	4.26	3.52	2.81	2.63	2.02	3.64	38.81

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

29. EMPORIUM, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	3.47	4.56	5.12	2.33	1.06	4.45	8.46	5.40	1.17	3.48	4.01	4.96	48.47
1892	3.29	3.77	3.87	1.64	7.38	6.13	2.67	3.02	2.78	1.35	3.24	.94	40.08
1893	3.11	5.91	2.92	4.21	4.99	4.83	2.37	3.00	2.10	3.36	2.05	4.07	42.92
1894	3.85	3.08	1.24	3.89	9.45	3.06	2.09	1.37	5.26	3.94	1.81	2.93	41.97
1895	4.79	.50	1.60	2.53	3.08	4.95	3.06	2.98	2.89	1.82	2.59	3.37	34.16
1896	1.17	3.68	4.36	1.88	3.36	6.75	5.11	1.62	5.69	3.31	3.60	1.82	42.35
1897	2.30	3.20	4.03	3.49	3.42	2.04	5.28	2.13	2.73	.94	5.13	4.20	38.89
1898	4.54	1.47	5.80	2.59	4.21	3.90	4.13	5.87	1.89	6.24	3.37	2.66	46.67
1899	2.91	3.66	4.69	2.57	3.92	3.32	4.32	3.78	4.89	2.21	2.86	4.80	43.93
1900	3.16	2.85	4.50	1.29	3.46	2.43	4.48	3.50	1.36	3.84	5.05	2.08	38.00
1901	2.55	1.08	3.01	5.03	6.74	4.39	4.07	6.29	4.05	1.23	2.94	5.22	46.60
1902	2.27	3.23	3.78	3.32	2.29	7.15	12.35	2.49	2.93	2.06	1.72	5.00	48.59
1903	4.07	5.21	4.84	2.76	1.37	5.44	8.42	5.92	1.56	4.03	3.67	2.88	50.17
1904	3.04	3.09	6.18	4.74	3.28	5.11	5.46	4.13	4.59	2.08	.64	2.89	45.23
Mean	3.18	3.24	4.00	3.02	4.14	4.57	5.16	3.68	3.14	2.85	3.05	3.42	43.45

31. LOCK HAVEN, PA.

1891	4.21	4.21	4.06	1.48	1.85	5.14	6.95	4.40	3.41	2.81	2.82	4.44	45.78
1892	4.86	1.37	4.73	1.21	4.91	9.66	3.92	3.72	1.34	.38	3.34	1.35	40.79
1893	2.71	5.28	2.26	4.72	4.89	2.51	3.34	2.82	3.70	2.67	1.09	2.14	38.13
1894	1.77	3.67	.84	5.81	[3.19]	3.52	2.96	5.51	6.46	5.73	1.99	3.73	45.18
1895	4.73	1.00	1.69	.79	2.35	4.84	2.83	3.27	3.18	1.35	2.48	3.46	31.97
1896	.85	4.44	4.05	1.02	1.49	3.67	5.16	3.59	5.46	4.44	2.64	1.02	37.83
1897	1.67	2.67	3.17	2.90	4.65	2.72	5.14	3.94	3.93	.77	4.93	2.59	39.08
1898	4.11	1.51	5.02	2.24	4.10	3.45	3.76	4.90	.36	5.19	2.24	2.14	39.02
1899	2.16	3.72	3.27	1.06	3.30	3.80	2.16	5.05	3.57	.43	3.26	3.56	35.34
1900	2.40	4.04	3.42	1.20	.94	1.53	3.03	4.45	.65	4.92	4.95	1.70	33.23
1901	2.32	.80	4.11	5.67	7.42	3.53	3.21	6.54	4.38	1.37	2.90	5.72	47.97
1902	2.70	3.59	4.93	5.01	.70	6.12	8.34	1.86	4.52	3.93	1.06	4.27	47.03
1903	3.73	2.99	3.97	2.81	1.69	7.44	5.34	6.37	3.20	3.76	1.67	2.37	45.34
1904	3.66	2.33	4.99	4.52	3.66	2.73	2.92	4.09	1.95	1.92	.48	2.83	36.08
Mean	2.99	2.97	3.61	2.89	3.22	4.33	4.22	4.32	3.29	2.83	2.56	2.95	40.18

32. LEWISBURG, PA.

1891	3.33	3.75	6.40	2.39	0.67	5.21	5.09	9.42	2.90	3.75	2.40	4.40	49.71
1892	[2.88]	[3.34]	5.53	2.34	4.96	5.21	3.40	4.55	4.18	.22	3.94	.70	41.25
1893	2.40	4.57	3.07	4.62	6.42	4.36	2.35	[5.11]	1.74	3.20	1.61	[3.43]	42.88
1894	2.84	2.46	1.13	5.33	9.40	2.39	1.36	2.06	5.09	6.02	1.86	4.06	44.00
1895	3.10	1.35	1.38	2.41	3.66	4.13	2.54	4.22	4.11	1.29	2.96	4.09	35.24
1896	1.98	4.46	3.74	1.11	2.16	4.70	5.62	1.39	3.66	5.58	5.35	1.29	41.04
1897	3.26	2.54	4.74	3.21	4.30	2.31	4.72	2.52	2.01	2.08	4.76	3.94	40.39
1898	3.62	2.27	4.23	2.83	6.04	2.79	4.21	9.68	.93	5.76	2.33	2.44	47.13
1899	2.55	4.57	4.36	1.89	4.32	3.83	1.53	5.49	4.36	1.36	2.88	3.98	41.12
1900	2.33	3.92	5.60	1.07	3.16	3.21	3.26	4.08	.65	3.05	4.24	2.38	36.95
1901	1.67	.74	4.49	4.39	7.95	2.09	5.02	10.60	3.85	1.16	1.75	6.90	50.61
1902	3.53	4.41	5.84	2.76	.62	8.28	6.86	2.12	6.40	4.86	1.80	4.96	52.44
1903	3.95	4.85	3.32	4.34	2.40	8.02	5.73	5.21	2.21	3.47	1.69	2.00	47.19
1904	4.52	1.62	3.75	3.78	5.40	1.94	3.61	3.76	3.41	2.69	.72	1.79	36.99
Mean	3.00	3.20	4.11	3.03	4.39	4.18	3.95	5.02	3.25	3.18	2.74	3.31	43.36

34. GIRARDVILLE, PA.

1899	2.76	6.69	4.85	2.02	3.53	5.40	4.99	7.40	6.65	1.02	2.63	4.19	52.13
1900	2.65	5.63	5.50	.94	1.29	3.70	6.96	4.77	1.22	3.32	3.77	3.03	42.78
1901	2.48	1.03	5.68	2.52	5.59	1.39	3.21	12.05	4.20	2.81	2.51	7.87	51.34
1902	4.22	6.45	6.39	3.57	1.31	7.70	5.02	2.83	8.44	6.92	1.90	7.04	61.79
1903	4.28	5.86	4.72	4.23	2.28	7.95	6.19	5.15	3.05	6.75	1.87	4.83	57.16
1904	5.78	2.91	5.39	3.42	4.01	5.95	4.26	4.04	6.50	[4.16]	2.55	[5.39]	54.36
Mean	3.70	4.76	5.42	2.78	3.00	5.35	5.10	6.04	5.01	4.16	2.54	5.39	53.25

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

35. SELINSGROVE, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	4.70	3.09	8.39	1.82	1.36	4.74	6.69	7.18	4.12	4.46	3.85	3.97	54.37
1892	5.13	.88	3.92	1.60	6.25	8.18	4.77	3.17	3.29	.37	4.30	1.90	43.76
1893	2.78	5.63	3.57	4.64	6.85	4.44	2.32	4.07	3.12	4.21	2.40	2.75	46.78
1894	1.22	3.87	1.09	5.45	10.03	2.40	1.20	2.47	4.25	5.58	2.08	3.76	43.40
1895	[2.88]	1.26	2.92	2.55	3.26	3.39	2.54	4.58	1.53	1.80	1.50	3.06	31.27
1896	.90	5.71	4.04	1.16	2.40	2.49	6.36	2.18	3.81	4.36	3.47	.73	37.61
1897	1.85	3.26	3.74	3.25	4.74	2.62	5.08	1.88	2.56	1.89	6.35	3.56	40.78
1898	4.08	2.06	3.87	2.98	5.28	1.61	5.63	6.86	.91	6.22	2.90	2.72	45.12
1899	1.76	4.87	4.58	1.37	4.45	4.04	2.42	4.63	4.72	1.53	3.26	2.61	40.24
1900	2.60	3.59	3.69	1.16	.72	2.09	3.74	2.38	1.59	3.65	3.89	2.18	31.28
1901	2.03	.80	4.11	3.73	7.73	2.50	5.59	8.50	3.52	1.34	1.66	4.84	46.35
1902	3.28	3.23	5.08	3.23	.94	8.11	4.79	1.69	5.16	4.90	1.54	4.26	46.21
1903	4.20	4.84	3.29	4.39	1.78	7.57	4.39	4.91	3.01	3.72	1.53	3.98	47.61
1904	3.99	3.76	3.36	3.70	6.27	3.02	5.04	2.53	4.68	2.40	.70	2.45	41.90
Mean	2.96	3.35	3.98	2.93	4.43	4.09	4.33	4.07	3.30	3.32	2.82	3.06	42.64

36. CENTERHALL, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1895	[2.30]	[3.43]	[4.32]	[2.27]	[3.56]	5.70	3.60	4.70	2.10	1.20	2.33	3.94	39.45
1896	2.18	[3.43]	3.77	1.41	2.00	4.06	5.66	1.26	6.23	3.92	3.11	1.63	38.66
1897	2.20	4.17	5.08	3.84	5.79	4.03	4.96	2.43	4.06	1.78	5.43	4.19	47.96
1898	3.89	1.16	5.16	2.60	4.87	2.89	2.86	7.37	1.26	6.70	2.60	3.90	45.26
1899	2.07	4.54	4.42	.88	5.66	3.05	2.36	3.79	3.90	2.12	1.96	3.87	38.62
1900	1.95	4.09	3.58	1.52	1.92	3.70	3.48	2.56	.88	[3.17]	[2.57]	[3.23]	32.65
1901	[2.30]	[3.43]	[4.32]	[2.27]	[3.56]	[4.43]	5.45	11.30	2.73	.71	2.46	[3.23]	[46.19]
1902	1.50	[3.43]	[4.32]	[2.27]	[3.56]	[4.43]	[4.04]	[5.00]	[3.04]	5.20	.80	[3.23]	[40.82]
1903	[2.30]	3.21	3.90	3.35	1.10	7.59	3.91	6.61	3.19	3.75	1.89	1.84	42.64
1904	2.90	2.07	4.91	5.18	2.38	3.79	5.72	3.01	1.26	[3.17]	[2.57]	1.32	38.28
Mean	2.36	3.30	4.38	2.56	3.44	4.37	4.20	4.80	2.86	3.17	2.57	3.04	41.05

38. STATE COLLEGE, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	4.11	5.29	4.07	1.47	1.94	4.24	5.65	5.40	2.20	4.38	2.98	4.08	45.81
1892	3.98	1.73	3.78	2.09	5.79	7.36	3.26	5.78	2.24	.28	3.62	1.07	40.98
1893	1.94	5.71	1.88	5.13	6.46	3.94	4.10	3.14	2.22	3.23	3.04	2.26	43.05
1894	1.75	3.39	1.14	3.85	9.45	4.60	2.10	2.13	5.78	3.13	1.59	3.14	42.05
1895	4.18	.22	1.03	2.23	2.21	6.74	3.11	3.70	1.75	1.03	1.74	2.75	30.69
1896	1.40	4.10	2.82	1.47	1.37	5.02	5.56	1.56	5.02	3.29	3.11	1.04	35.76
1897	2.21	3.19	4.53	3.78	4.13	3.03	5.69	3.39	3.60	1.45	5.26	3.18	43.44
1898	4.40	1.14	5.63	2.29	4.28	3.53	2.95	4.70	.93	6.51	2.28	3.07	41.71
1899	2.60	3.42	4.23	1.71	4.77	2.41	2.14	2.76	3.84	1.40	3.06	2.53	34.87
1900	1.65	3.39	3.81	1.93	2.30	2.54	3.36	2.95	.63	3.22	4.10	1.77	31.65
1901	1.82	.73	3.71	4.62	6.14	2.46	3.60	8.97	2.35	.40	2.06	6.59	43.45
1902	3.02	2.92	4.91	3.13	.92	6.71	5.76	1.37	2.59	4.25	1.44	4.82	41.84
1903	3.50	3.61	4.18	3.81	1.24	7.28	4.04	6.85	2.61	3.51	1.89	1.67	44.19
1904	2.72	3.28	4.04	5.42	2.10	4.19	6.30	1.74	1.86	2.18	.42	1.78	36.03
Mean	2.81	3.01	3.55	3.07	3.79	4.58	4.12	3.89	2.69	2.73	2.61	2.84	39.69

39. GRAMPIAN, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1895	5.19	0.96	1.90	3.81	2.38	2.87	2.85	3.08	2.20	1.26	2.57	3.48	32.55
1896	1.22	3.57	4.02	2.40	2.20	5.76	8.83	3.98	4.45	2.62	3.26	1.82	44.13
1897	2.15	2.78	4.25	4.14	4.55	3.14	7.02	2.46	3.16	.68	6.04	4.57	44.94
1898	3.81	2.06	8.40	2.30	3.30	5.03	3.41	4.12	1.54	5.21	3.55	3.56	46.29
1899	3.12	3.03	4.42	1.67	5.34	3.00	3.84	3.54	3.00	1.56	2.31	3.96	38.79
1900	3.21	3.63	3.64	1.36	2.77	[4.13]	[5.18]	[3.76]	[2.75]	3.32	4.71	2.40	40.86
1901	2.03	1.98	1.88	5.22	3.51	[4.13]	[5.18]	4.22	2.95	.26	[3.74]	[3.30]	38.40
1902	2.42	1.84	2.87	3.71	2.81	[4.13]	[5.18]	[3.76]	[2.75]	[2.43]	[3.74]	[3.30]	[38.94]
1903	[2.89]	4.64	4.89	3.72	2.51	4.98	5.15	4.94	1.98	4.55	[3.74]	[3.30]	47.29
1904	5.75	3.09	6.06	(a)	------	------	------	------	------	------	------	------	------
Mean	3.18	2.76	4.23	3.15	3.26	4.13	5.18	3.76	2.75	2.43	3.74	3.30	41.36

a No record.

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

40. ALTOONA, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	2.35	4.59	2.64	1.39	1.97	7.73	3.99	3.13	2.71	2.54	1.89	2.96	37.89
1892	2.08	1.57	2.37	1.66	5.35	5.33	2.50	2.96	1.94	.10	2.69	[2.64]	31.19
1893	1.65	3.21	1.06	3.48	4.67	2.94	2.50	2.92	1.85	2.71	1.48	2.15	30.62
1894	.99	1.82	.80	1.69	9.32	2.66	1.01	3.18	5.25	1.77	.74	2.30	31.53
1895	3.22	.17	1.05	2.16	.80	3.75	1.75	1.64	2.28	.55	1.30	2.50	21.17
1896	.87	1.94	1.77	1.38	2.70	7.69	4.22	1.70	6.03	1.66	2.59	.89	33.44
1897	.95	2.09	3.44	2.91	2.52	2.44	3.22	2.08	2.89	.71	4.31	2.17	29.73
1898	4.05	1.23	5.81	2.22	6.55	1.99	1.91	3.75	.76	7.44	2.14	2.67	40.52
1899	2.41	3.33	4.79	1.64	5.62	1.79	3.67	4.46	3.82	1.23	2.89	2.70	38.35
1900	2.21	3.55	3.12	1.22	3.91	2.53	3.25	3.90	1.48	3.63	4.54	1.50	34.84
1901	1.89	.78	4.07	6.22	5.85	4.04	5.83	5.34	2.29	.59	2.03	4.92	43.85
1902	2.85	2.60	3.96	5.30	1.30	4.95	6.88	1.12	1.58	4.36	1.05	5.37	41.32
1903	3.84	4.59	4.38	2.99	2.63	4.34	4.51	5.08	1.93	3.36	1.82	1.50	40.97
1904	3.03	2.39	4.12	4.40	2.93	3.09	4.68	1.69	1.73	1.43	.63	1.98	32.10
Mean	2.31	2.42	3.10	2.76	4.01	3.95	3.57	3.07	2.61	2.29	2.15	2.59	34.83

41. HUNTINGDON, PA.

1891	3.58	3.84	4.48	1.92	1.84	4.24	4.49	3.80	2.07	3.13	2.39	4.18	39.96
1892	4.22	1.86	5.11	2.29	6.24	6.44	3.48	4.03	2.81	.12	3.04	1.55	41.19
1893	2.10	5.27	2.07	4.61	7.79	2.37	2.39	3.49	3.50	3.70	2.46	2.46	42.21
1894	1.82	3.44	1.07	3.19	9.20	3.56	1.57	1.26	7.56	2.93	1.81	4.21	41.62
1895	5.16	.46	1.42	1.97	3.01	4.78	3.15	1.46	1.26	1.09	1.07	2.99	27.82
1896	2.13	2.99	3.32	1.85	2.56	7.93	3.60	2.29	7.42	2.24	3.04	.76	40.13
1897	1.65	4.69	3.95	3.86	4.69	4.27	3.13	3.38	3.31	1.74	5.16	3.19	43.02
1898	4.60	1.12	4.79	1.73	4.60	2.07	2.03	4.68	.67	6.54	2.02	2.41	37.26
1899	2.10	3.49	4.55	1.07	3.83	2.43	3.68	4.96	3.57	.49	3.25	2.60	36.02
1900	1.07	2.68	2.61	2.64	3.11	2.77	1.33	1.78	.64	2.51	4.33	1.38	26.85
1901	1.32	.67	3.30	4.18	5.19	1.59	5.20	5.63	2.49	1.50	.94	5.61	37.62
1902	2.44	2.98	5.24	3.79	1.30	7.18	4.30	1.72	3.21	5.67	.96	5.50	44.29
1903	3.80	5.38	4.13	3.04	1.76	6.32	4.84	6.43	3.02	3.64	1.83	1.40	45.59
1904	3.07	2.39	4.00	4.05	2.41	6.42	7.61	4.38	.84	1.91	.61	1.78	39.47
Mean	2.79	2.95	3.57	2.87	4.11	4.46	3.63	3.52	3.03	2.66	2.35	2.86	38.80

42. HARRISBURG, PA.

1891	4.73	3.31	4.25	1.70	1.77	3.76	8.40	5.20	1.75	2.87	1.95	3.71	43.40
1892	5.14	1.02	4.81	2.15	3.95	4.93	6.48	2.39	3.31	.15	4.15	1.17	39.65
1893	2.05	4.66	1.97	3.67	5.32	2.46	1.92	3.69	1.74	3.25	2.54	1.91	35.18
1894	1.77	4.56	1.30	2.27	6.07	3.25	1.89	4.08	5.53	4.60	1.90	3.34	40.56
1895	3.80	.54	1.94	3.67	1.98	1.66	1.16	2.36	2.18	1.63	1.72	3.38	26.02
1896	1.00	5.48	3.85	1.19	2.99	3.82	6.32	1.45	1.81	3.45	3.30	.40	35.06
1897	1.60	2.77	2.87	2.53	5.30	1.83	3.68	3.13	1.30	1.35	4.09	3.21	33.66
1898	3.23	1.60	3.04	1.95	6.13	1.98	5.07	8.44	2.08	5.26	3.15	3.16	45.09
1899	2.27	3.71	3.69	1.15	4.49	2.93	1.90	4.85	4.25	.78	2.13	1.83	33.98
1900	2.07	3.40	3.00	1.43	1.33	2.88	3.14	4.72	1.41	1.25	2.69	1.62	28.94
1901	1.83	.53	3.60	2.88	5.98	1.13	1.52	2.99	2.16	1.15	1.29	4.75	29.81
1902	3.28	5.49	2.98	2.73	.29	4.76	3.68	2.26	4.01	5.81	1.49	4.57	39.35
1903	3.67	4.19	3.76	3.24	.46	5.63	1.76	5.82	1.95	2.62	.88	1.92	35.90
1904	3.11	1.54	2.72	2.07	3.45	3.99	4.76	2.95	1.69	2.78	.54	2.39	31.99
Mean	2.82	3.06	3.13	2.33	3.54	3.22	3.69	3.88	2.51	2.50	2.27	2.67	35.62

Monthly and annual precipitation at stations in Susquehanna drainage basin—Continued.

43. LEBANON, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	[5.30]	3.33	5.30	2.19	3.00	3.40	8.70	5.06	1.07	3.14	2.44	4.34	47.27
1892	6.27	.95	4.91	2.22	5.14	4.75	4.75	3.80	3.63	.29	4.55	1.96	43.22
1893	2.10	5.67	2.63	3.67	8.05	2.21	2.67	5.30	3.79	3.95	3.42	2.35	45.81
1894	2.17	4.23	1.48	4.77	9.45	1.91	4.42	4.17	5.47	6.14	2.57	4.17	50.95
1895	4.70	.87	2.49	5.10	1.85	1.88	2.10	1.97	1.32	2.31	1.95	4.14	30.68
1896	1.11	6.31	5.29	1.29	4.54	4.51	6.38	.56	2.92	4.70	4.76	.68	43.05
1897	2.26	3.75	3.46	3.51	6.52	3.00	5.89	2.51	1.57	2.36	5.76	4.05	44.64
1898	4.27	1.59	3.20	3.18	7.90	1.30	3.58	10.43	.99	5.38	5.54	3.41	50.77
1899	3.67	5.16	5.21	1.51	4.53	5.54	1.91	3.18	6.20	.95	2.59	1.75	42.20
1900	2.81	5.50	2.94	2.08	2.13	3.64	5.43	4.26	1.84	1.35	2.85	2.39	37.22
1901	2.46	.84	4.36	4.02	6.05	3.24	3.61	8.66	3.65	1.40	1.39	6.35	46.03
1902	3.62	5.67	4.79	3.38	.43	6.18	4.21	5.49	4.43	5.93	1.45	7.46	53.04
1903	4.68	5.95	4.65	3.67	.94	6.08	3.94	7.28	2.55	4.48	1.28	3.15	48.65
1904	3.58	2.22	3.50	2.48	5.60	5.22	5.89	5.56	3.81	3.06	1.63	2.71	45.26
Mean	3.50	3.72	3.87	3.08	4.72	3.78	4.53	4.87	3.09	3.25	3.01	3.49	44.91

46. YORK, PA.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1891	3.65	3.37	6.07	2.01	2.39	3.98	10.77	3.29	1.88	3.20	2.13	4.20	46.94
1892	6.08	.10	3.94	1.70	4.10	3.81	8.59	2.81	2.66	.14	4.44	2.13	40.50
1893	1.76	4.76	1.76	4.37	6.53	2.50	1.58	3.40	1.57	3.03	3.55	2.22	37.03
1894	1.34	4.20	1.58	4.48	4.40	3.06	2.22	2.93	9.16	4.24	2.09	3.90	43.60
1895	4.03	.98	2.50	3.74	2.73	3.10	1.41	2.41	4.01	2.36	1.80	3.33	32.40
1896	.94	4.88	4.20	1.45	2.53	3.92	4.00	1.05	2.54	3.44	3.00	.45	32.40
1897	1.55	4.59	2.51	3.42	6.61	2.42	3.69	4.04	2.73	2.60	5.69	3.37	43.22
1898	3.67	1.15	3.00	2.71	6.86	1.08	3.47	6.44	1.82	4.31	4.75	3.58	42.84
1899	3.61	6.64	5.16	1.28	5.71	3.54	5.32	6.76	6.07	.92	3.59	1.18	49.78
1900	2.12	4.62	3.08	1.35	1.85	4.81	2.36	4.09	3.18	1.51	2.81	2.52	34.30
1901	2.72	.53	3.94	2.51	2.55	1.55	3.33	6.27	2.36	1.59	2.50	6.17	36.02
1902	2.73	6.74	4.80	3.41	1.24	5.15	5.74	4.22	4.12	6.40	2.39	6.15	53.09
1903	4.67	6.13	4.72	3.21	1.18	6.21	4.01	6.96	2.72	3.51	1.89	2.90	48.11
1904	4.39	1.08	2.93	(*a*)	------	------	------	------	------	------	------	------	--------
Mean	3.09	3.56	3.58	2.74	3.74	3.47	4.35	4.21	3.45	2.87	3.13	3.24	41.56

a No record.

FLOODS.

During the last century there have been several great floods on Susquehanna River, the most notable of which are those of March, 1865; June, 1889 (the Johnstown flood); May, 1894, and March, 1904.

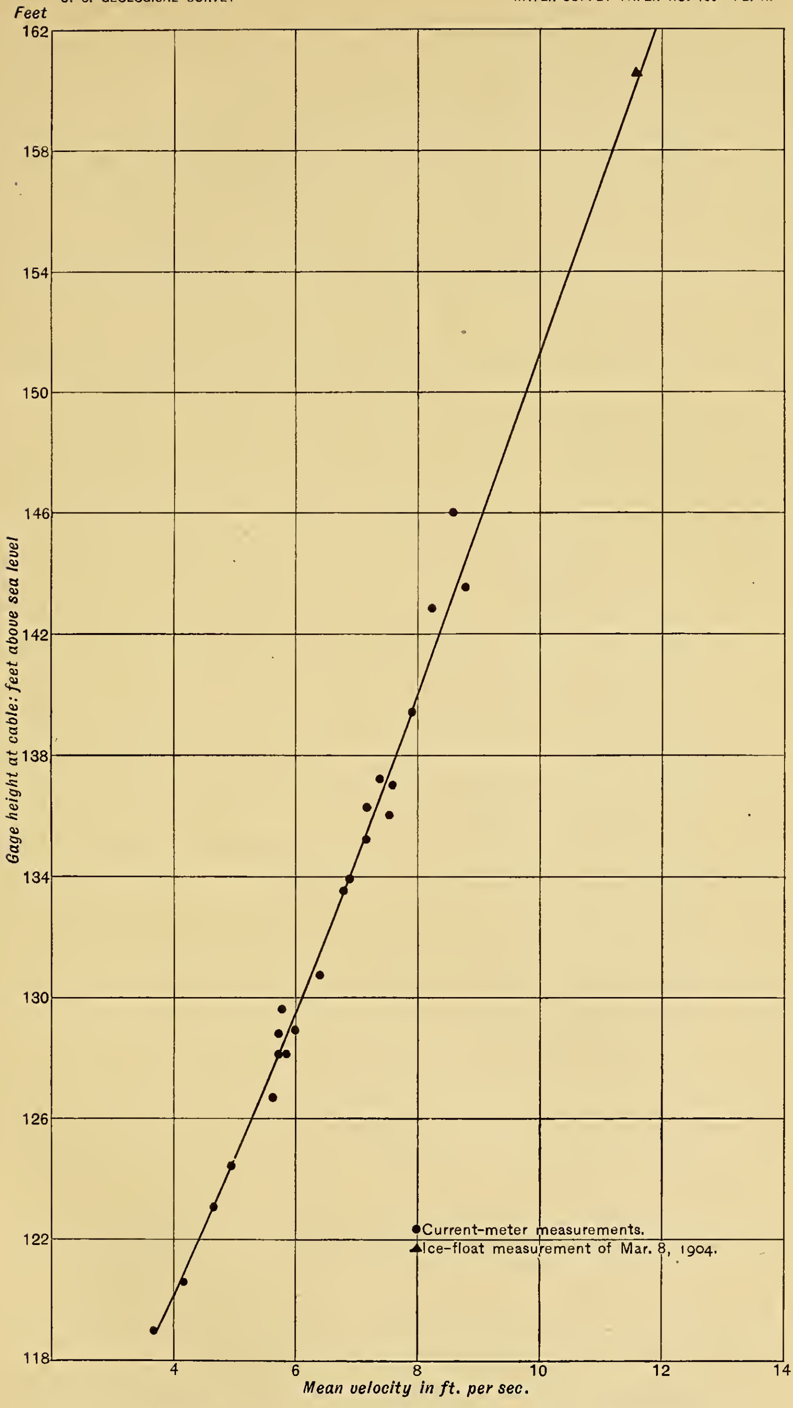
The flood of 1865 was the result of the rapid melting and passing away of a large quantity of ice and snow which had accumulated during an exceptionally severe winter. The amplitude of this flood was probably increased by ice gorges. No information in regard to the height of this flood has been obtained except that at the junction with the West Branch the river was 2 feet higher than during the June flood of 1889; and the old residents along other portions of the main river state that this flood was approximately the same as the June flood of 1889.

The flood of June, 1889, caused by the heavy rainfall of May 30 to June 1, probably exceeded any flood which has ever occurred on this stream. Being in the summer months, it was not augmented by ice gorges, and therefore illustrates the normal effect of high-water conditions. The table below, taken from the report of the Chief of Engineers, U. S. Army, shows the extent and duration of rainfall within the limits of the West Branch; it was upon the high table-lands of this portion of the basin that the heaviest precipitation took place.

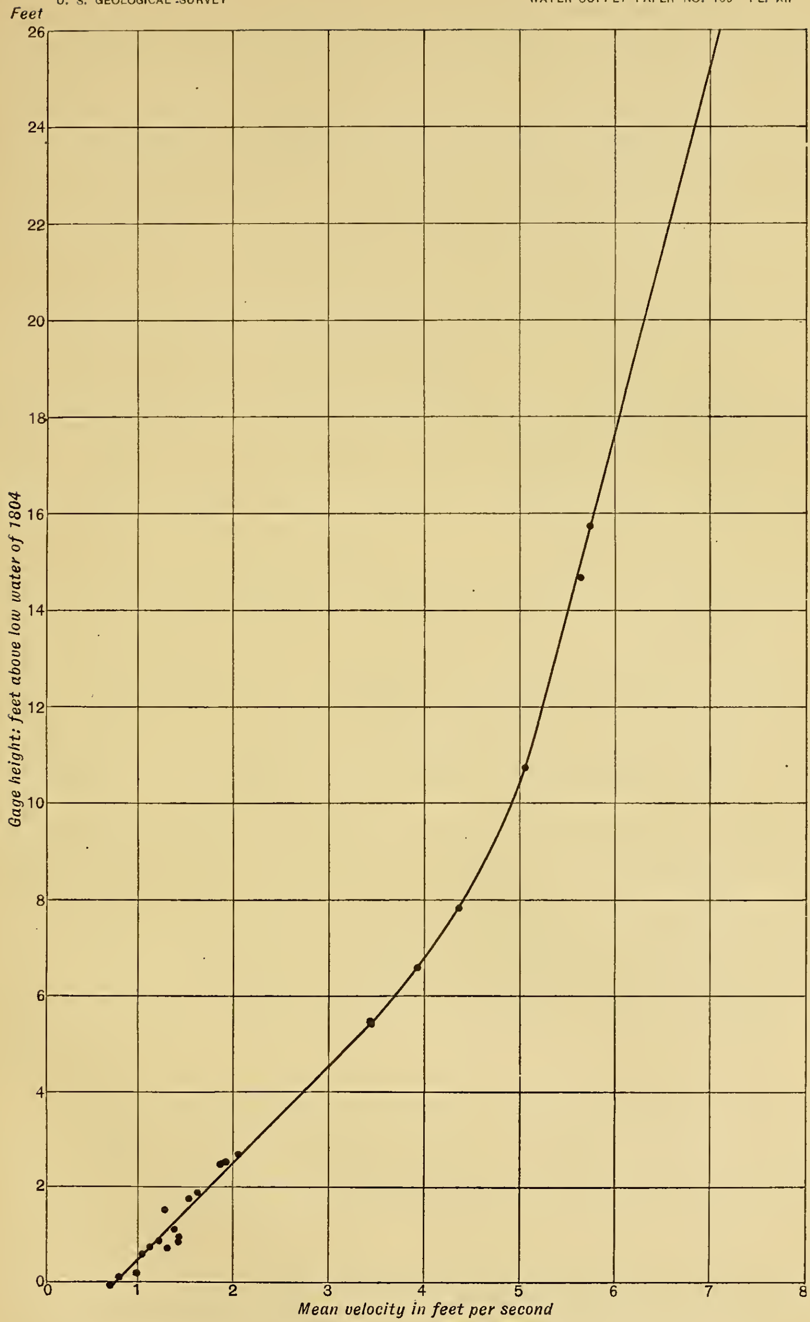
Rainfall over drainage area of West Branch, May 30 to June 1, 1889.

Station.	County.	Storm began—	Storm ended—	Duration.	Rainfall.
				Hrs.	*Ins.*
Siglerville	Mifflin	3 p. m. May 30	1 a. m. June 1	34	.....
Hollidaysburg	Blair	do	3 a. m. June 1	36	6.10
State College	Center	3.30 p. m. May 30	do	37	5.04
Lewistown	Mifflin	4 p. m. May 30	2 a. m. June 1	34	.....
Huntingdon	Huntingdon	do	do	34	7.50
Philipsburg	Center	do	3 a. m. June 1	35	6.09
Grampian	Clearfield	4.30 p. m. May 30	11.30 p. m. May 31	32	8.60
Emporium	Cameron	5 p. m. May 30	11 p. m. May 31	32	5.97
Coudersport	Potter	6 p. m. May 30	12 p. m. May 31	30	5.40
Selinsgrove	Snyder	do	3 a. m. June 1	33	7.53
Charlesville	Bedford	8 p. m. May 30	3 p. m. May 31	36	7.60
Williamsport	Lycoming	9 p. m. May 30	5 a. m. June 1	32	.....
Ralston	do	1 a. m. May 31	12 m. June 1	32	.....
Muncy	do	3 a. m. May 31	1 p. m. June 1	34	.....

From this table it is seen that the average duration of the rainfall was about thirty-four hours and that the average depth was about 6.6 inches. Under ordinary conditions about 50 per cent of the rainfall



CURVE OF MEAN VELOCITY FOR SUSQUEHANNA RIVER AT McCALLS FERRY, PA., CABLE STATION.



CURVE OF MEAN VELOCITY FOR SUSQUEHANNA RIVER AT HARRISBURG, PA.

in the Susquehanna drainage area reaches the outlet of the river. It is probable, however, that under extraordinary conditions, such as mentioned above, there was a run-off of at least 75 per cent of the rainfall.

Various methods of estimating the maximum discharge of the 1889 flood have been used, perhaps the most reliable indicating that about 593,000 second-feet flowed past Harrisburg, and 671,000 second-feet past McCalls Ferry. The basis of these estimates is shown in Pls. XI and XII, the other methods and results being given on pages 177 to 180.

Pls. XI and XII were prepared as follows: The mean velocities for the various discharge measurements taken at the respective stations were plotted with gage heights as ordinates and mean velocity in feet per second as abscissæ. Through these points a mean velocity curve was drawn and extended to reach the highest gage height of the flood. This curve shows the mean velocity for any stage of the river. The crest of the 1889 flood at Harrisburg was 27.1 feet above the low water of 1803 and at McCalls Ferry cable station about 162 feet above mean sea level. The curves show that the mean velocities for these heights are 7.24 feet per second and 11.90 feet per second, respectively. At each of these stations an accurate cross section was determined, and the product of the area below the flood line and the mean velocity for that gage height, as taken from the extended mean velocity curve, gives the flow of the river. In this method of estimating flood discharges the uncertainty due to the area of the cross section, as when the discharge curve is produced, is eliminated. A study of other mean velocity curves made in this manner shows that the liability to error in the mean velocity is comparatively small, and it is probable that this method gives a better estimate than either Kutter's formula or the discharge curve.

The result is a maximum flow at McCall Ferry about 13 per cent greater than at Harrisburg, which accords with the assumption that the discharge between two points on the same river where the drainage area is similar should increase in proportion to the drainage area. At McCalls Ferry the drainage area is 11.4 per cent greater than at Harrisburg.

The loss of life caused by the flood within the drainage area of the West Branch was 78, and the flood relief commission disbursed nearly $300,000 to the sufferers within this district, but no attempt was made to secure even an approximate estimate of the damage. The flood of May, 1894, near McCalls Ferry was 2 or 3 feet lower than the 1889 flood.

The primary cause of the flood of March, 1904, was the breaking up of the ice in January without enough water behind it to force it down the river. Gorges were formed at various points along the river and

its branches, which were greatly solidified by the exceptionally cold weather in the following month. When the final break came these gorges were still further augmented and acted as dams, impounding the large quantity of water which was so destructive to property along the shores.

On March 6 and 7 there were heavy rains all over the drainage area, and on the morning of March 8 the floods so caused began to break through the various barriers. It finally forced the big gorges at Highspire and Bainbridge, wiping out islands and doing much damage in its course.

After the flood had subsided at York Haven, the gorge moved to Turkey Hill, where it stood for several hours and backed the water to within a few feet of the Columbia Bridge. Between 1 and 2 p. m. this gorge in turn gave way and moved to Shanks Ferry, where it gorged for the last time. Although it held here for only a few moments, it raised the water and ice 6 feet above the railroad track at Safe Harbor, completely destroying the stone-arch bridge there and leaving ice throughout the village to the height of the second-story windows.

The elevation of the crest of the flood, as shown for a portion of the river by the table on page 175, varied in height at various places along its course, as compared with the June flood of 1889. At York Furnace the height was about 3 feet greater; about a mile above McCalls Ferry it was practically the same; at McCalls Ferry station it was 3 feet lower, and at the head of Cullys Falls it was again about the same height.

There came down with the flood wave a large amount of ice, which varied from 3 to 10 feet in thickness, as shown by the blocks left on the shores. Owing to the cross currents in the river, the greater portion of the ice went down on the York County side, and it was on this side that most of it was left piled up on the shores. The channel on the Lancaster County shore soon cleared itself, and but little ice accumulated upon that bank.

The gorge at Turkey Hill broke about 2 o'clock in the afternoon, and at 3.30 p. m. the water reached a maximum height at McCalls Ferry. At the cable station it was 161.3 feet above sea level on the Lancaster County side and 159.8 feet on the York County side. Within half an hour from the time the maximum height was reached the water had fallen from 2 to 3 feet, and on the morning of March 9 it had fallen 15 feet.

Between Shanks Ferry and Port Deposit no more ice jams were formed, and the ice passed through the channel of the river very rapidly and caused but little damage. The history of nearly all floods has been that between "The Neck" and Port Deposit but little gorging takes place and that the river rapidly clears itself from any

ICE FLOOD OF 1875 AT WILKESBARRE, PA.

FLOOD OF MARCH 8, 1904, AT ITS HEIGHT AT YORK HAVEN, PA.

ice and seldom rises to such a height as to cause particular damage along the shores. At Port Deposit there is frequent trouble, for the shallow sand bars and tidal backwater often cause gorges which flood the tracks and lower part of the town.

Elevations of flood on lower portion of Susquehanna River, March 8, 1904.

Locality.	Elevation.	Remarks.
	Feet.	
Fort Cullys Falls, gage No. 5	139.5	Approximate.
Lock 13 (behind ice)	136.2	Ice gorged in channel above.
600 feet above Lock 13	140.1	Made of drift.
500 feet above Lock 12	143.0	Observed during flood.
Power house, gage 2	146.6	Do.
Dam line, York side	146.7	Do.
High-water gage 10	147.7	Do.
McCalls Ferry, York County	150.7	Observed during flood; in backwater behind ice.
McCalls Ferry, Lancaster County	151.8	Observed during flood.
At telegraph line on T. P	156.3	Do.
Station 71+80 on T. P	158.8	Do.
At cable, York County	159.8	Observed during flood; behind ice.
At cable, Lancaster County	161.3	Drift marks.
Tucquan culvert	167.5	Do.
Milepost 29	175.5	Watermark on post.
York Furnace station	179.5	Watermark on station.
York Furnace Hotel	178.6	Observed during flood.
Pequea Bridge	182.6	Watermarks on house and post.
Milepost 31	182.7	Watermarks on post.
Shanks Ferry Hotel	185.7	Observed during flood.
Milepost 32	186.3	Watermarks on posts.
Safe Harbor	204.0	Watermarks on station.

Above Shanks Ferry much damage was done, and the loss of property was great at many points. The facts are interesting to those who contemplate power development in the lower portion of Susquehanna River, as the possible damage from ice has been one of the great objections to such development.

The full effect of the flood on the main stream was not felt below Sunbury, being restrained by the big gorges at Kipps Run, Catawissa, and Nanticoke, which held several days longer. It was at its worst in Wyoming Valley on the 9th, doing much damage to Plymouth, Wilkesbarre, and Pittston, and then quietly passed away without noticeable effect on the lower river.

A rough estimate of damage due to flood, as given by press reports, is as follows:

Damage due to flood of March, 1904.

Pittston to Sunbury [a]	$6,500,000
York County [b]	200,000
Lancaster County	275,000
Dauphin County [c]	275,000
Cumberland County	200,000
Perry County	200,000
Snyder County	125,000
Juniata County	100,000
Maryland	100,000
Total	7,975,000

The loss and damage to State bridges was reported as $800,000.

The table below gives a comparison of the heights during the flood period at various points along the river.

1904 flood heights, in feet, above low water of September, 1900.

Date.	Main river at McCalls Ferry (4 p. m.).	Main river at Harrisburg (7 a. m.).	Main river at Wilkesbarre (8 a. m.).	West Branch at Williamsport (7.30 a. m.)	Juniata at Newport (12 m.).
1904.					
March 3	9.0	11.9	9.0	7.4	4.4
March 4	9.9	13.5	11.2	18.9	10.7
March 5	15.0	22.0	16.0	16.4	6.1
March 6	15.0	19.4	14.9	9.1	3.2
March 7	13.4	16.3	15.4	7.3	2.7
March 8	33.6	21.2	26.3	17.6	11.2
March 9	17.2	15.9	28.5	13.4	7.2
March 10	17.4	15.0	24.0	9.7	4.4
March 11	17.9	12.0	21.9	7.5	3.2
March 12	13.6	9.2	19.9	6.4	3.2
Maximum height attained	[a] 33.6	[b] 23.3	[c] 28.5	[d] 18.9	----------

[a] March 8, 4 p. m. [b] March 4, 3 p. m. [c] March 9, 8 a. m. [d] March 4, 7 a. m.

NOTE.—Maximum heights other than at McCalls Ferry were caused by backwater from gorges.

[a] Of which one to two millions were in Wyoming Valley.
[b] Most damage at York Haven and vicinity.
[c] Of which Middletown losses amounted to about $109,000.

A

B

McCALLS FERRY IN FLOOD OF MARCH 8, 1904

A, At beginning of flood; *B*, after flood.

A

B

ICE LEFT BY FLOOD OF MARCH 8, 1904.

A, At York Haven, Pa.; *B*, below McCalls Ferry, Pa.

The cable gaging station about three-fourths mile above McCalls Ferry offered a good opportunity for determining the amount of water flowing at the maximum stage. At this point two cables are stretched across the river 80 feet apart, and at the time of the flood the sun was shining in line with these and bright enough to cast their shadows on the white ice, thus enabling the determination of the velocity at this point with considerable degree of accuracy. The velocity was determined in four different portions of the river, and several individual determinations were made in each portion. The result of this measurement is shown in the table below.

Flood discharge at cable station, McCalls Ferry, Pa., March 8, 1904, 4 p. m.

[Elevation water surface, Lancaster County side, 161.3 feet; York County side, 159.8 feet; mean 160.6 feet.[a]]

Stations.	Surface velocities.	Mean velocity 90 per cent of surface.	Area.	Discharge.	Remarks.
	Ft. per sec.	*Ft. per sec.*	*Sq. feet.*	*Sec.-feet.*	
50 to 125	0	....	4,710	0	Ice piled along towpath. No apparent velocity.
125 to 625	20	18	23,560	424,000	Velocity obtained by timing ice cakes between cables 80 feet apart.
625 to 725	13.3	12	4,600	55,200	Do.
725 to 825	0	....	4,370	0	Backwater behind Streepers Island.
825 to 975	13.3	12	6,960	83,500	Velocity obtained by timing ice cakes between cables 80 feet apart.
975 to 1180	11.4	10.2	6,700	68,300	Do.
1180 to 1320	0	....	3,600	0	Ice and backwater.
Total	....	....	54,500	631,000	Mean velocity 11.6 feet per second.

[a] Corresponding gage height for 1889 flood was about 162 feet, with discharge of 671,000 second-feet.

The table on page 178 gives the estimated maximum, minimum, and mean discharge of Susquehanna River at Harrisburg for 1891 to 1904, inclusive.

Minimum, maximum, and mean discharge of Susquehanna River at Harrisburg, Pa., for 1891 to 1904, inclusive.

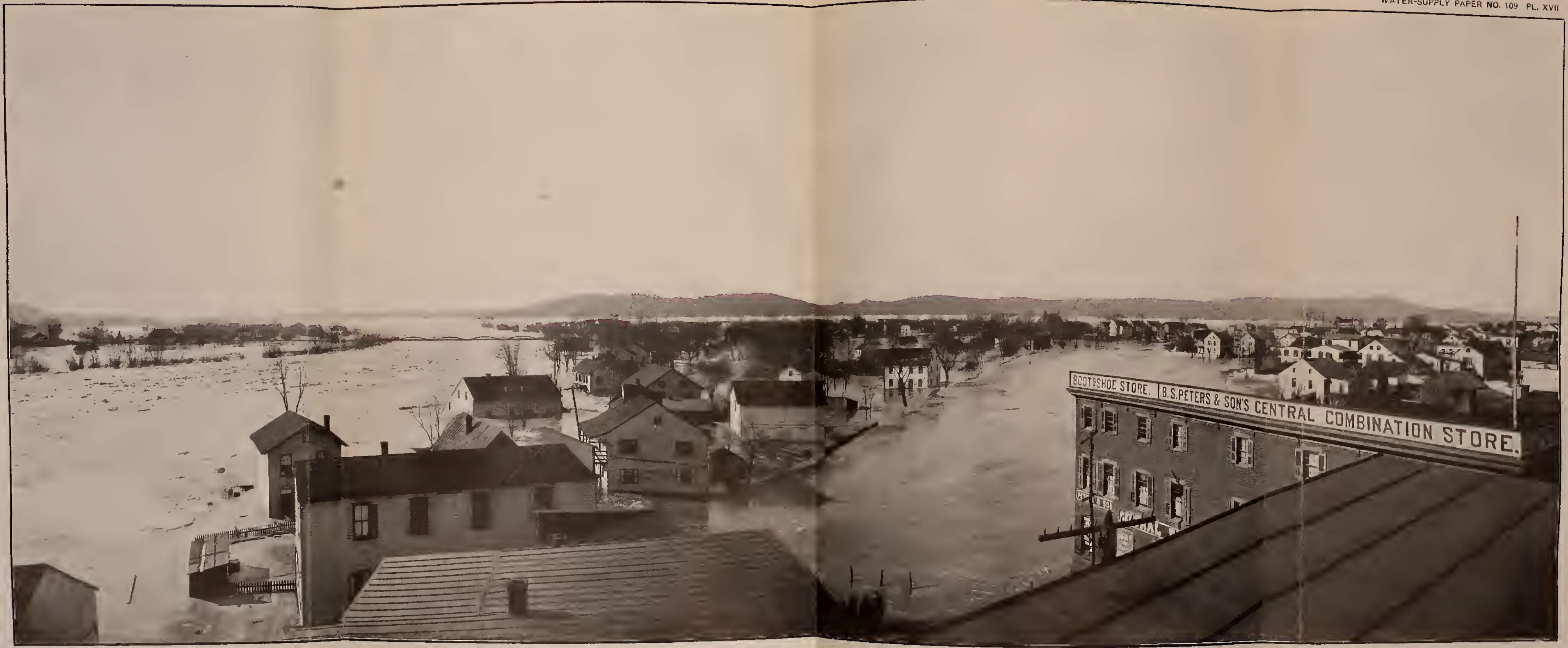
Year.	Minimum.			Maximum.			Mean discharge.
	Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.	
		Feet.	*Sec.-ft.*		*Feet.*	*Sec.-ft.*	*Sec.-ft.*
1891	Oct. 4–7, inclusive	1.60	10,200	Feb. 19	19.00	334,500	52,200
1892	Oct. 31–Nov. 8, inclusive	.50	4,070	Apr. 6	14.65	224,200	37,250
1893	Aug. 16–19, inclusive, 25	.35	3,500	May 6	16.50	267,400	40,550
1894	Sept. 5–6	.25	3,160	May 22	25.60	543,500	39,970
1895	Oct. 30–31	.05	2,570	Apr. 11	13.65	205,400	29,330
1896	Sept. 5–13	.25	3,160	Apr. 1–2	14.60	223,200	34,600
1897	Sept. 15, Oct. 21	.50	4,070	Mar. 26	11.50	165,306	32,320
1898	Oct. 3–7	.65	4,740	Mar. 24	15.65	245,900	40,490
1899	Oct. 24 and 25	.15	2,850	Mar. 7	13.00	193,000	31,000
1900	Sept. 28 and 29	—.04	2,360	Mar. 2	13.10	194,900	29,950
1901	Nov. 12	1.00	6,550	Dec. 16	21.40	405,100	42,380
1902	Sept. 23, 24, 25	.85	5,760	Mar. 2	23.90	484,100	47,100
1903	Oct. 7	1.40	8,850	do	16.85	276,500	54,510
1849	Dec. 11	0.84	5,708				32.318
For the 14 years	Sept. 28–29, 1900	—.04	2,360	1894. May 22	25.60	543,500	38,855

FLOOD DISCHARGES AND VALUES OF "N" BY KUTTER'S FORMULA.

Owing to the lack of high-water gagings on Susquehanna River, it became necessary to estimate the flood discharges by means of the slope formula, $v=c\sqrt{Rs}$, using Kutter's formula to fix the value of c. The 1889 flood is the highest on record, and as there remain many of its high-water marks made by eyewitnesses along the railroad and canal above McCalls Ferry, Pa., the mean slope along this part of the river could be closely approximated. These marks consist of notches on posts, rocks, hotels, bridge piers, and locks, and their elevations were accurately determined, as shown on the profile.

Ten sections, located as shown on Pl. XVIII, were then chosen from the contour map. These were selected so as to show as far as possible the average for the portions of the river represented, so that the mean slope between the nearest reliable high-water marks could be used in connection with them. The sections were carefully surveyed and sounded to determine their area and wetted perimeter.

In order to get a value for n in Kutter's formula the slopes were measured on the west channel of the Duncans Run section during



MIDDLETOWN, PA., DURING FLOOD OF MARCH 8, 1904.

several gagings. With these slopes and the data from the gagings made on July 24 and 26, 1902, June 5, 1903, and March 8, 1904, the coefficients c and n have been computed by the formulas—

$$Q=Av;\ v=c\sqrt{Rs};\ c=\frac{41.6+\frac{.00281}{s}+\frac{1.811}{n}}{1+\frac{\left(41.6+\frac{.00281}{s}\right)n}{\sqrt{R}}},$$

as shown in the table below.

Values of c and n, with data used in their determination.

Date.	Discharge.	Area.	Wetted perimeter.	(R) Hydraulic radius.	(V) Mean velocity.	Coefficient (c).	Observed slope (s).	Computed coefficient (n).	Remarks.
	Sec.ft.	*Sq.ft.*	*Feet.*	*Feet.*	*Feet per sec.*				
July 24, 1902[a]	78,300	9,340	560	16.68	8.38	54.9	0.0014	0.0468	El. W. S. 150′ above line=130.72′; El. W. S. 150′ below line=130.30′; Fall in 300′ 0.42′
July 26, 1902[a]	68,000	8,650	557	15.51	7.86	54.8	.00133	.0462	Fall in 300′ as above = 0.40′
June 5, 1903[a]	10,000	3,846	380	10.12	2.60	52.3	.000244	.0460	Fall in 900′ = 0.22′
Mar. 8, 1904[b]	631,000	63,400	2,420	26.20	9.96	52.45	.00138	.0545	Slope taken between McCalls Ferry and Gage No. 2.

[a] At Duncans Run. [b] At section No. 10.

The three measurements at Duncans Run give a coefficient of about 0.046. The conditions there are exceptionally favorable for this part of the river, so that as the flood sections in many cases included brushy and wooded islands, the value of n as used in the computations was increased to 0.05.

The data and results showing the discharge at the respective sections during the 1889 flood are shown in table on page 180.

The mean of the discharges of these 10 sections gives a maximum for the 1889 flood of about 730,000 second-feet, or 9 per cent greater than the mean velocity curve estimate of 671,100 second-feet. (See pages 177 and 180.)

In this connection it is of interest to note that if a coefficient equaling 0.055, as determined by the single measurement at section 10, based upon the flood gaging of March 8, 1904, had been used, the mean discharge for the 1889 flood would have been about 685,000 second-feet, or only 2 per cent greater than the results obtained by using the mean velocity curve.

The general equation of the discharge curve shown on Pl. X is approximately that of the parabola $(y-111)^2=.00202\,x$, which for a gage height of 149.5 gives the 1889 flood discharge as 733,800 second-feet.

From these estimates it may be assumed that the maximum discharge of the 1889 flood was between 670,000 and 735,000 second-feet.

In determining n at section 10 by means of the flood measurement of March 8, 1904, the slope used was between McCalls Ferry and gage No. 2, the same points as were taken for the 1889 flood slope, thus making the two comparable and indicating that the assumed value of n=.05 is on the safe side.

Discharge of Susquehanna River during 1889 flood as computed by Kutter's formula.

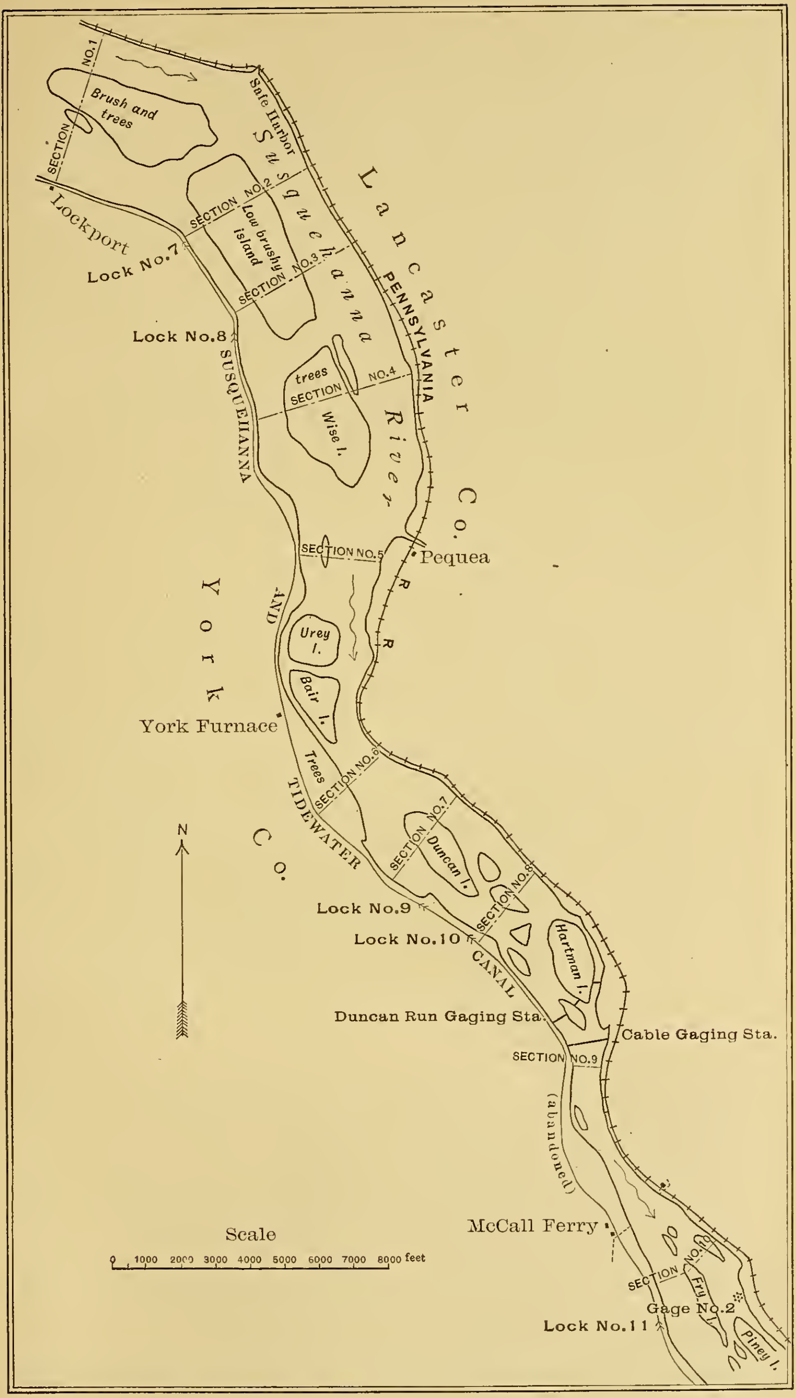
$$Q=Ac\sqrt{Rs};\ c=\frac{77.82+\frac{.00281}{s}}{1+\frac{2.08+\frac{.00014}{s}}{\sqrt{R}}}$$

No. of section.	Area.	Wetted perimeter.	Hydraulic radius.	Mean slope.	Coefficient (N).	Mean velocity.	Discharge.	Remarks.
	Sq. feet.	*Feet.*	*Feet.*			*Ft. per sec.*	*Sec. ft.*	
1	89,300	4,750	18.80	0.0012	0.05	7.98	713,000	One-fourth of section is brushy island.
2	105,500	4,210	25.06	.00060	.05	6.91	730,000	One-third of section is low, brushy, rocky island.
3	110,400	4,300	25.66	.00060	.05	7.02	775,000	Do.
4	113,600	5,020	22.63	.00064	.05	6.67	758,000	One-fourth of section covered with trees or brush.
5	110,500	3,220	34.32	.00035	.05	6.61	730,000	One-sixth of section covered with brush.
6	63,700	2,800	22.75	.00130	.05	9.43	602,000	One-fourth of section is covered with trees.
7							739,000	
8	89,500	2,800	31.96	.00070	.05	8.72	780,000	One-fourth of section is rocky island.
9							720,000	
10	72,800	2,430	29.95	.00110	.05	10.38	756,000	One-fourth of section covered with brush or trees.
Mean							730,300	

LOW-WATER CONDITIONS.

At the time of the establishment of the gage at Harrisburg, in 1891, the lowest-known water on Susquehanna River was in 1803, and the zero of the gage was placed at the elevation of this low water.

The months of August and September, 1900, were periods of extreme drought, and beginning with the 1st of September the observations at Harrisburg showed a gradual falling of the river until September



MAP SHOWING SECTIONS USED IN KUTTER'S FORMULA DETERMINATIONS NEAR McCALLS FERRY, PA.

28–29, when the gage read 0.04 of a foot below the low-water mark of 1803. During this period of low water Mr. E. G. Paul, hydrographer, United States Geological Survey, spent considerable time in measuring the flow at the various stations in the Susquehanna drainage basin. On September 21 a measurement was made at Harrisburg at a gage height of 0.08 of a foot and a discharge of 2,655 second-feet. Mr. Paul returned to Harrisburg on September 28, at which date the river reached its extreme low point of −0.04 of a foot, and made a measurement giving a discharge of 2,357 second-feet.

The measurements made by Mr. Paul during the week of September 28, 1900, at Allenwood, Danville, and Newport, Pa., as shown by the table below, gave a very close check upon the Harrisburg work, and show that the measurements as made at the various points along the river are consistent among themselves and that no errors greater than would be expected in work of this kind exist.

Comparison of minimum discharges of Susquehanna River and its branches.

Date.	Stream.	Station.	Discharge.	Remarks.
			Sec.-feet.	
Sept. 24, 1900	West Branch	Allenwood, Pa.	511	Gage same height as on Sept. 28.
Sept. 25, 1900	Susquehanna	Danville, Pa	822	Gage 0.1 of a foot lower than Sept. 26–28.
Sept. 22, 1900	Juniata	Newport, Pa	418	Gage same as Sept. 28.
Total discharge from gagings above Harrisburg			1,751	
Add 14 per cent for increase in drainage area			258	
Add for 0.1 lower gage height at Danville			140	
Total estimated discharge above Harrisburg			2,149	
Gaging at Harrisburg Sept. 28			2,357	
Difference			208	

From the best available authorities the elevation of lowest water, in September, 1900, at McCalls Ferry, gage No. 2, was about 112.6 feet. The measured minimum discharge at Harrisburg for that month was 2,357 second-feet, and by increasing this figure 11.4 per cent, to allow for the increase in drainage area, we find the corresponding maximum discharge at McCalls Ferry to be about 2,620 second-feet. In order to check this result, the mean velocities of the various discharge measurements made at Duncans Run have been plotted as abscissæ and their respective gage heights as ordinates, as shown in Pl. XIX. These points, it will be seen, seem to follow a general law, and a curve has been drawn through them

which has been extended through the gage height of the lowest water, which at Duncans Run was about 114.2 feet. The velocity from the curve for that gage height is 1.0 foot per second, and the area of the section is 2,940 square feet, the product of these two giving a discharge of 2,940 second-feet as a rough check on the above. The lowest water actually measured at McCalls Ferry was on September 25, 1902, at a gage height on gage No. 2 of 114.34 feet, giving a discharge of 6,370 second-feet. The mean discharge from the rating table at Harrisburg on that date was 5,760 second-feet, corresponding to a difference in drainage area of 10.6 per cent. The table on page 178 gives the minimum estimated discharge at Harrisburg for the years 1891 to 1904, inclusive.

ACCURACY OF STREAM MEASUREMENTS.

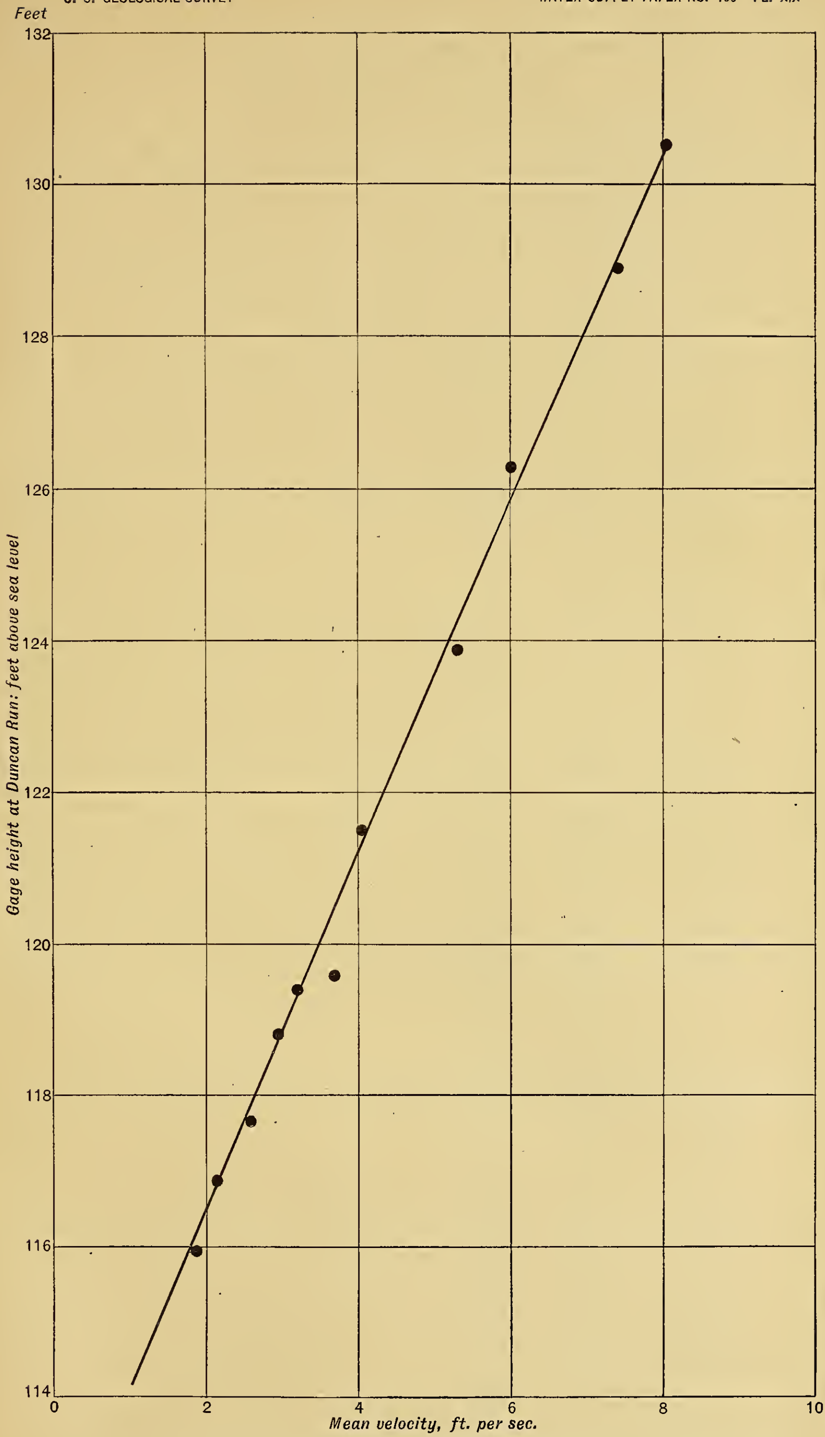
Considerable comment has been made upon the hydrographic work of the United States Geological Survey on Susquehanna River by engineers and others who are promoting power schemes in the lower portion of the river, and it was to obtain varying data that the late George S. Morison, engineer for the McCalls Ferry project, established a gaging station at that point.

As stated on page 130, the McCalls Ferry station was established in May, 1902, and during the following year 35 discharge measurements were made at stages which ranged between the highest and lowest gage heights during this period. These measurements were taken with great care, vertical velocity curves being used in most cases. From the measurements a rating curve and table was prepared, by which, in connection with the daily gage heights, both the daily and the monthly discharges of the river were computed, as shown on pages 137–139.

On comparing the monthly discharges at McCalls Ferry from June 1, 1902, to December 31, 1904, as obtained by Mr. Morison's engineers, with those obtained by the United States Geological Survey at Harrisburg, as shown in the table on page 183, it is found that the mean monthly discharge is approximately between 7 and 25 per cent greater at McCalls than at Harrisburg. This difference is what would be expected, as the drainage area at McCalls Ferry is 11.4 per cent greater than that at Harrisburg.

It is thus seen that the methods of stream measurement used by the Geological Survey give results which agree with those obtained by private engineers, whose work is generally carried on in greater detail and at much greater cost.

An inspection of the discharge curves shows that almost all of the individual measurements plot nearly on the curve, very few of them varying from it by more than 3 per cent. This fact, while it does not prove their accuracy, indicates that the measurements were carefully made and that the results are consistent.



CURVE OF MEAN VELOCITIES FOR SUSQUEHANNA RIVER AT DUNCANS RUN, NEAR McCALLS FERRY, PA.

Comparison of the estimated monthly discharge of Susquehanna River at Harrisburg and McCalls Ferry, Pa.

Month.	Mean discharge in second-feet.			
	Harrisburg.	McCalls Ferry.	Difference.	
			Second-feet.	Per cent.
1902.				
June	12,810	13,908	1,098	+ 7.9
July	70,209	61,768	−8,441	−13.7
August	26,962	27,126	164	+ .6
September	11,714	11,556	− 158	− 1.4
October	35,656	38,248	2,592	+ 6.8
November	20,985	22,657	1,672	+ 7.4
December	63,774	69,111	5,337	+ 7.7
The period	34,587	34,911	324	+ .9
1903.				
January	37,765	43,533	5,768	+13.2
February	93,236	95,082	1,846	+ 1.9
March	133,500	134,461	961	+ .7
April	82,715	79,900	−2,815	− 3.4
May	14,297	16,826	2,529	+15.0
June	27,964	29,859	1,895	+ 6.4
July	32,581	35,636	3,055	+ 8.6
August	25,581	28,206	2,625	+ 9.3
September	30,511	34,183	3,672	+10.7
October	45,160	48,757	3,597	+ 7.4
November	27,289	30,797	3,508	+11.4
December	19,743	19,751	− 8	0
The year	47,528	49,638	2,110	+4.3
1904.				
April	74,230	78,400	4,170	+ 5.3
May	41,740	46,720	4,980	+10.7
June	29,320	34,580	5,260	+15.2
July	18,020	21,410	3,390	+15.8
August	10,420	13,880	3,460	+24.9
September	8,657	11,050	2,393	+21.7
October	15,240	18,700	3,460	+18.5
November	10,760	13,320	2,560	+19.2
December	8,448	10,890	2,442	+22.4
The period	24,090	27,660	3,570	+12.9

NOTE.—Owing to an ice gorge below Harrisburg the monthly means for January, February, and March have been estimated by taking 89 per cent of means for McCalls Ferry.

VERTICAL VELOCITY MEASUREMENTS.

The standard with which all velocity determinations in stream-measurement work are compared is the mean velocity obtained by the vertical velocity method. This method consists in taking, in a vertical line, a series of velocity determinations, which when plotted with depths as ordinates and velocities as abscissæ give the basis for the construction of a velocity curve along the vertical in question. This curve shows the variation in velocity from the surface to the bottom of the stream, and from it the mean velocity for the vertical can be determined by dividing the area included within the curve by the depth. From these curves not only the depth at which the mean velocity occurs can be found, but also coefficients for reducing to the mean the velocities found at the top, bottom, or at other points.

In the work in the Susquehanna drainage area three series of vertical velocity measurements have been made, as follows: At McCalls Ferry, Pa.; at Binghamton, N. Y., and at Harrisburg, Pa.

The series at McCalls Ferry, Pa., was made during the years 1902 and 1903 by Messrs. Boyd Ehle and R. H. Anderson and consisted of 73 determinations at the Duncans Run section and 104 measurements at the cable section. The depths at the first section varied from 3 to 30 feet and the mean velocities from 1.2 to 5.8 feet per second. At the second section the depths ranged from 3 to 36 feet and the mean velocities from 1.2 to 9.7 feet per second. These great depths and the high velocities at which these measurements were made make them by far the most interesting series of the kind that have been made.

The bed of the stream at both of these points is very irregular and is made up mostly of solid rock, strewn with large bowlders, as shown in Pl. I, *B*, thus making the velocities near the bottom hard to determine.

The secondary guy cable with which the station is equipped, as noted on page 131 and shown on Pl. IX, *A*, enabled the observer to hold the meter at a depth which it is very difficult to reach under ordinary conditions.

The results of the measurements have been tabulated and are given in the tables on pages 185–187, and the platted curves are shown in Pls. XX to XXVI, inclusive.

A study of these tables shows that in order to draw any conclusions from the results the individual determinations must be grouped, in order to bring together those which were taken under the same conditions. The grouping for the Duncans Run series was made according to depth as follows: Group 1, 4 to 10 feet; group 2, 10 to 20 feet; group 3, 20 to 30 feet, and those for the cable station according to the distance from the initial point.

Rejecting disturbed and discordant observations, the averages from these groups give the results shown in the table on page 188.

Vertical velocity measurements at Duncans Run, above McCalls Ferry, Pa.

Distance from initial point, in feet.	Depth, in feet.	Velocity, in feet, per second by following methods: Vertical velocity.	0.6 depth.*	Top and bottom.	Top.	Coefficient for reducing to mean velocity. 0.6 depth.	Top and bottom.	Top.	Depth of thread of mean velocity.* In feet.	In per cent of depth.
9	15.5	2.52	2.73	1.77	3.00	0.92	1.42	0.84	10.5	68
10 a	18.0	2.26	2.50	1.80	2.40	.90	1.26	.94	13.6	76
10	22.5	3.12	3.40	2.63	3.32	.92	1.19	.94	15.2	68
10	16.0	2.02	2.20	1.69	2.42	.92	1.20	.84	11.7	73
15	19.0	2.74	2.92	2.25	3.35	.94	1.22	.82	12.7	67
15 a	18.0	2.58	2.63	2.40	2.73	.98	1.08	.94	12.7	71
20	16.0	1.79	2.10	1.38	1.20	.86	1.30	1.49	13.7	86
20 a	17.8	2.43	2.68	1.72	2.62	.90	1.41	.93	12.8	72
20	22.0	2.96	3.30	2.16	3.32	.90	1.37	.89	15.5	71
25 a	20.5	2.62	2.72	2.14	2.85	.96	1.22	.92	15.4	75
28 a	19.0	1.83	2.32	1.18	1.10	.79	1.55	1.66	15.5	82
30 a	18.0	1.68	2.10	1.28	1.13	.80	1.31	1.48	16.2	90
30 a	23.0	2.64	2.82	2.31	2.90	.94	1.14	.91	17.5	76
40 b	4.0	2.68	2.88	2.58	3.05	.93	1.04	.88	2.5	63
50 b	4.3	3.30	3.55	3.44	3.46	.93	.96	.96	3.1	72
60 b	3.3	3.10	3.64	2.52	4.36	.85	1.23	.71	2.2	67
70 b	5.0	3.60	3.62	3.60	3.83	1.00	1.00	.94	3.2	64
80 b	9.0	3.55	3.45	3.51	4.50	1.03	1.01	.79	4.8	53
90 b	5.0	4.66	4.65	4.48	4.73	1.00	1.04	.98	3.0	60
100 b	4.5	5.80	6.05	4.43	5.30	.96	1.31	1.10	3.0	67
110 b	6.0	3.86	4.13	3.70	4.22	.94	1.04	.91	4.0	67
120 b	7.5	2.42	2.48	2.53	2.72	.98	.96	.89	5.3	71
122 b	14.0	3.04	3.28	2.28	3.70	.93	1.33	.82	9.1	65
130 a	12.0	2.12	2.30	1.95	2.06	.92	1.09	1.03	9.5	79
130	14.0	2.38	2.42	2.15	3.10	.98	1.11	.77	8.8	63
132 a	13.5	3.20	3.30	3.14	3.05	.97	1.02	1.05	12.6	93
130	20.0	3.41	3.50	2.96	3.83	.98	1.15	.89	12.7	64
140	20.5	2.24	2.30	1.97	2.58	.97	1.14	.87	14.4	70
140	22.0	2.46	2.62	2.20	2.58	.94	1.12	.95	15.1	69
140	25.0	3.48	3.71	2.70	4.03	.94	1.29	.86	16.7	67
140	25.0	2.63	2.80	2.01	3.08	.94	1.31	.86	16.5	66
150 a	20.0	2.20	2.27	2.06	2.34	.97	1.07	.94	14.7	73
150	21.5	2.93	3.05	2.83	2.96	.96	1.04	.99	15.7	73
150	22.5	2.65	2.75	2.59	2.76	.96	1.02	.96	16.4	73
150	27.5	3.38	3.58	2.55	3.83	.94	1.32	.88	20.3	74
160 a	24.0	1.97	2.02	1.66	2.13	.98	1.19	.92	15.3	64
160	26.5	2.54	2.67	2.25	2.62	.96	1.13	.97	18.0	68
160	31.0	3.03	3.06	2.62	3.83	.99	1.16	.79	19.3	62
160	27.0	2.72	2.98	2.30	3.05	.92	1.18	.89	19.3	72
170 b	24.5	2.02	2.22	1.73	2.10	.91	1.17	.96	18.0	73
170	25.5	2.35	2.54	2.06	2.48	.92	1.14	.95	17.8	70
170	28.0	3.22	3.18	2.75	3.79	1.01	1.17	.85	16.0	57
170	24.0	2.80	3.00	2.37	2.84	.94	1.18	.99	19.7	82
180 b	17.0	2.10	2.14	2.12	2.10	.98	.99	1.00	16.0	94
180	25.0	1.87	2.20	1.42	2.25	.85	1.32	.83	17.0	68
180	29.0	2.77	3.00	2.20	3.79	.92	1.26	.73	18.1	62
180	16.0	2.82	2.94	2.70	2.60	.96	1.04	1.08	15.0	94
190 b	25.0	1.84	1.92	1.67	1.92	.96	1.10	.96	16.7	67
190	27.0	2.16	2.33	1.88	2.34	.93	1.15	.92	20.4	75
190	30.0	2.98	2.87	2.46	3.70	1.04	1.21	.80	17.4	58
190	25.0	2.75	2.75	2.69	2.81	1.00	1.02	.98	15.0	60
200 b	25.0	1.70	1.83	1.28	1.92	.93	1.33	.88	17.0	68
200	26.0	2.20	2.38	1.72	2.25	.92	1.28	.98	18.7	72
200	26.5	2.39	2.46	1.93	2.72	.97	1.24	.88	17.4	66
210 a	21.0	1.69	1.78	1.50	1.79	.95	1.13	.94	16.5	78
210	22.5	2.17	2.30	1.88	2.20	.94	1.15	.98	17.7	79
210	21.5	2.78	2.78	2.77	3.11	1.00	1.00	.90	12.9	60
220 a	18.5	1.58	1.66	1.37	1.73	.95	1.15	.92	15.5	84
220	19.5	2.06	2.09	2.08	2.10	.98	.99	.98	14.5	74
220	20.0	2.52	2.58	2.40	2.63	.98	1.05	.96	13.8	69
230 a	16.3	1.45	1.57	.94	1.56	.92	1.54	.93	11.0	68
230	16.0	2.40	2.50	2.25	2.54	.96	1.07	.94	11.0	69
230	17.0	1.75	1.85	1.62	2.02	.95	1.08	.87	11.5	68
240 a	13.0	1.31	1.36	1.30	1.28	.96	1.01	1.02	11.0	85
240	15.0	1.67	1.80	1.60	1.83	.93	1.04	.91	10.8	72
240	14.5	2.37	2.41	2.27	2.47	.98	1.04	.96	9.5	66
250 a	10.0	1.21	1.35	1.11	1.09	.90	1.09	1.11	8.6	86
250	12.5	1.55	1.73	1.44	1.56	.90	1.08	1.00	9.7	78
250	13.5	1.90	2.00	1.62	2.10	.95	1.17	.90	9.0	67
260 b	8.0	1.24	1.40	1.14	1.25	.88	1.09	.99	6.0	75
260	8.0	1.25	1.35	1.21	1.56	.93	1.03	.80	5.5	69
260	9.5	1.70	1.65	1.66	2.04	1.03	1.02	.84	5.0	53

* From vertical velocity curve. [a] Even rock bottom. [b] Uneven rock bottom.

Vertical velocity measurements at cable station above McCalls Ferry, Pa.

Distance from initial point, in feet.	Depth, in feet.	Velocity, in feet per second, by following methods—			Coefficient for reducing to mean velocity.		Depth of thread of mean velocity.[a]	
		Vertical velocity.	0.6 depth.[a]	Top.	0.6 depth.	Top.	In feet.	In per cent of depth.
150 [b]	8.0	3.26	3.22	3.70	1.01	0.88	4.6	58
	10.0	4.30	4.40	4.82	.98	.89	6.5	65
	10.0	4.06	4.24	4.48	.96	.91	7.3	73
	12.0	4.15	4.68	4.45	.89	.93	9.3	77
	13.0	4.80	5.20	5.27	.92	.91	9.6	74
	19.0	5.76	6.40	5.75	.90	1.00	15.0	79
200 [b]	8.7	4.00	4.08	4.38	.98	.91	6.7	77
	10.0	5.20	5.45	5.75	.95	.90	7.3	73
	11.0	5.00	5.30	5.33	.94	.94	8.2	75
	14.0	6.75	7.06	7.07	.96	.96	11.0	78
250 [b]	7.0	3.42	3.68	3.67	.93	.93	5.6	80
	9.0	4.90	5.00	5.43	.98	.90	6.3	70
	16.5	7.50	7.45	7.77	1.01	.96	10.6	64
300 [c]	7.0	4.64	5.05	5.30	.92	.88	5.3	76
	8.0	4.85	5.15	5.45	.94	.89	6.0	75
	16.5	7.60	6.63	9.60	1.14	.79	12.6	76
350 [b]	6.0	4.20	4.27	4.35	.98	.96	5.0	83
	8.0	4.76	4.88	5.27	.98	.90	6.5	81
	9.0	5.40	5.65	5.75	.96	.94	7.0	78
	16.0	8.12	8.70	9.60	.93	.85	12.7	79
385 [c]	13.0	2.47	2.57	2.70	.96	.92	9.0	69
400 [c]	10.0	1.22	1.01	1.73	1.21	.71	3.5	35
	14.0	3.28	3.28	3.70	1.00	.89	8.4	60
	15.0	2.96	3.00	3.63	.99	.82	9.2	61
	15.0	3.74	3.55	4.78	1.05	.78	7.7	51
	15.0	5.20	5.72	5.30	.91	.98	11.6	77
	16.0	4.13	4.28	5.58	.97	.74	11.0	69
	18.0	5.13	4.93	6.83	1.04	.75	8.2	46
	22.5	7.62	8.12	8.90	.94	.86	16.2	72
450 [c]	8.0	3.18	3.30	3.38	.96	.94	6.0	75
	10.0	5.69	6.13	5.87	.93	.97	7.7	77
	15.5	5.75	6.10	6.20	.94	.93	10.7	69
	14.0	8.15	8.47	9.35	.96	.87	9.8	70
	16.0	9.16	9.60	10.90	.95	.84	11.3	70
500 [b]	16.0	3.80	4.12	3.90	.92	.98	13.1	82
	16.5	3.74	3.83	3.93	.98	.95	15.3	93
	21.5	5.03	5.17	5.17	.97	.97	19.0	88
	24.5	6.02	6.00	6.88	1.00	.88	14.4	59
	27.0	7.77	7.70	9.10	1.01	.85	15.8	59
	28.0	7.50	7.80	8.75	.96	.86	18.7	67
	36.0	9.00	9.22	10.00	.98	.90	23.8	66
550 [b]	16.0	4.30	4.30	5.17	1.00	.83	9.6	60
	19.0	4.24	4.41	4.85	.96	.87	12.6	66
	21.0	4.33	4.42	5.00	.98	.87	13.1	62
	24.5	6.38	6.38	7.50	1.00	.85	14.7	60
	28.0	7.20	7.22	8.15	1.00	.88	17.0	61
	28.0	7.47	7.62	7.97	.98	.94	20.2	72
	35.0	9.70	9.80	10.65	.99	.91	22.2	63
600 [b]	17.0	3.95	4.10	4.55	.96	.87	11.3	66
	20.0	4.30	4.50	4.90	.96	.88	13.3	66
	21.0	4.97	5.02	5.40	.99	.92	14.1	67
	25.0	6.30	6.43	6.63	.98	.95	17.8	71
	28.5	7.40	7.42	7.47	1.00	.99	17.5	61
	29.0	7.54	7.64	8.05	.99	.94	22.0	76
	35.0	8.23	8.62	9.25	.96	.89	25.2	72
625 [c]	15.0	3.27	3.00	4.20	1.09	.78	7.9	53
650 [c]	5.5	5.15	5.57	6.05	.92	.85	3.9	71
	11.0	5.80	5.65	6.53	1.03	.89	6.0	55
	15.0	6.84	6.45	7.73	1.06	.88	6.9	46
	17.0	6.83	6.50	7.73	1.05	.88	8.5	50
650	18.0	6.70	6.60	8.17	1.01	.82	10.5	58
	21.0	7.64	8.07	8.51	.95	.90	16.6	79
	26.0	7.44	7.70	8.92	.97	.83	17.6	68
700 [b]	4.5	4.70	4.97	5.35	.95	.88	3.1	69
	8.0	5.28	5.60	6.08	.94	.87	5.8	73
	8.0	4.97	5.20	5.20	.96	.96	6.2	78
	13.7	6.24	6.45	7.25	.97	.86	9.2	67
	15.0	6.12	6.30	6.75	.97	.91	10.1	67
	15.5	6.00	6.12	6.85	.98	.88	10.4	67
	20.0	6.67	7.00	7.42	.95	.90	16.7	84
	24.5	7.00	7.37	7.87	.95	.89	19.3	79
750 [c]	5.5	5.00	5.60	6.10	.89	.82	4.0	73
	12.0	5.56	5.70	6.20	.98	.90	7.9	66
	12.0	5.22	5.25	6.40	.99	.82	7.3	61
	13.5	5.30	5.47	6.33	.97	.84	8.8	65
	15.0	6.33	6.85	7.07	.93	.90	12.3	82
	20.0	5.50	5.50	6.65	1.00	.83	12.0	60

[a] From vertical velocity curve. [b] Regular bottom. [c] Rough and irregular bottom.

Vertical velocity measurements at cable station above McCalls Ferry, Pa.—Continued.

Distance from initial point, in feet.	Depth in feet.	Velocity, in feet per second, by following methods— Vertical velocity.	0.6 depth.	Top.	Coefficient for reducing to mean velocity. 0.6 depth.	Top.	Depth of thread of mean velocity. In feet.	In per cent of depth.
800 *a*	6.0	5.60	5.73	6.33	0.98	0.89	3.8	63
	11.0	5.80	6.20	6.80	.94	.85	7.9	72
	11.5	6.17	6.20	7.00	1.00	.88	7.2	63
	15.0	5.78	6.12	6.20	.94	.93	12.1	81
	16.0	6.12	6.40	7.00	.96	.87	12.3	77
	21.5	5.36	5.55	5.60	.97	.96	16.6	77
850 *a*	6.0	3.83	3.95	4.13	.97	.93	4.2	70
	11.0	4.97	5.15	5.63	.96	.88	7.5	68
	13.0	4.87	5.15	5.05	.95	.96	9.7	75
	15.0	4.80	4.95	5.45	.97	.88	10.6	71
	15.0	4.66	4.82	5.63	.97	.83	10.6	71
	16.0	5.54	5.85	5.72	.95	.97	13.0	81
	21.0	6.82	7.17	7.23	.95	.94	16.5	79
900 *a*	7.0	1.38	1.45	1.62	.95	.85	4.8	69
	9.0	3.14	3.35	4.00	.94	.79	6.7	74
	13.0	3.38	3.56	3.77	.95	.90	9.7	75
	16.0	5.00	5.43	5.38	.92	.93	12.3	77
	16.0	4.94	5.20	5.32	.95	.93	11.2	70
	18.0	5.30	5.35	5.87	.99	.90	12.0	67
	19.0	6.06	6.23	6.32	.97	.96	16.0	84
	25.0	7.20	7.35	8.05	.98	.90	19.7	79
950 *a*	7.7	1.85	1.98	2.02	.93	.92	5.5	71
	10.0	2.67	2.75	3.14	.97	.85	6.3	63
	12.7	3.32	3.43	4.00	.97	.83	8.6	68
	16.0	4.90	5.07	5.50	.97	.89	11.3	71
	16.5	5.07	5.10	5.80	.99	.87	10.2	62
	17.7	6.40	6.66	7.07	.96	.91	14.0	79
	2.4	7.70	7.80	8.28	.99	.93	17.4	73

a Regular bottom.

Recapitulation and deductions from vertical velocity measurements at Duncans Run.

Group.	No. of observations.	Depth.	Coefficients for reducing to mean velocity. Six-tenths depth.	Top and bottom.	Top.	Depth of thread of mean velocity in per cent of total depth.
		Feet.	*Per cent.*	*Per cent.*	*Per cent.*	
1	12	4 to 10	94.3	106.7	92.2	67.8
2	23	10 to 20	94.8	115.5	92.2	71.7
3	25	20 +	94.8	118.4	91.7	70.1

From the above table we find, first, that the depth of the thread of mean velocity ranges from about 68 to 72 per cent of the total depth, and that holding the meter at 0.6 depth gives a result about 5 per cent too large; second, that the coefficient for reducing top velocity to mean velocity is practically 92 per cent; third, that the coefficient for reducing the mean of the top and bottom velocities to mean velocity ranges from 106 to 118 per cent. The discordance here is due to the roughness of bed, which reduces the bottom velocity to a minimum.

Recapitulation and deductions from vertical velocity measurements at cable station, McCalls Ferry, Pa.

Distance from initial point, in feet.	Depths, in feet.	Velocities, in feet per second.	Number of observations.	Coefficients for reducing to mean velocity.		Depth of thread of mean velocity in per cent of total depth.
				Six-tenths depth.	Top.	
150	8 to 19	3.3 to 5.8	6	0.94	0.92	71
200	9 to 14	4.0 to 6.8	4	.95	.93	76
300	7 to 16	5.0 to 6.6	3	1.00	.85	76
350	6 to 16	4.2 to 8.1	4	.96	.91	80
500	16 to 36	3.8 to 9.2	7	.97	.91	73
550	16 to 35	4.3 to 9.7	7	.99	.88	63
600	17 to 29	4.0 to 7.5	7	.98	.92	68
700	4 to 24	4.7 to 7.0	8	.96	.89	73
850	6 to 21	3.8 to 6.8	7	.96	.91	74
900	7 to 25	1.4 to 7.2	8	.96	.90	74
950	8 to 24	1.9 to 7.7	7	.97	.89	70
Mean	5 to 36	1.4 to 9.7	68	.97	.90	72

An examination of the above table shows, first, that the thread of mean velocity varies between about 63 and 80 per cent of the total depth, and that holding the meter at 0.6 depth gives a result between 0 and 6 per cent too large, with an average of about 3 per cent. Second, that the coefficient for reducing top to mean velocity ranges from about 85 to 93 per cent, with a mean of 90 per cent.

From July 1, 1901, to August 15, 1902, Mr. E. C. Murphy made a special study of the accuracy of current-meter work and the laws of flowing water, on Chenango and Susquehanna rivers, at Binghamton, N. Y. A detailed account of these studies can be found in Water-Supply and Irrigation Paper No. 95, from which paper the data used in the following are taken.

Figs. 4 and 5 show contours of the bed and position of the piers and abutments at the two measuring stations. The Chenango River

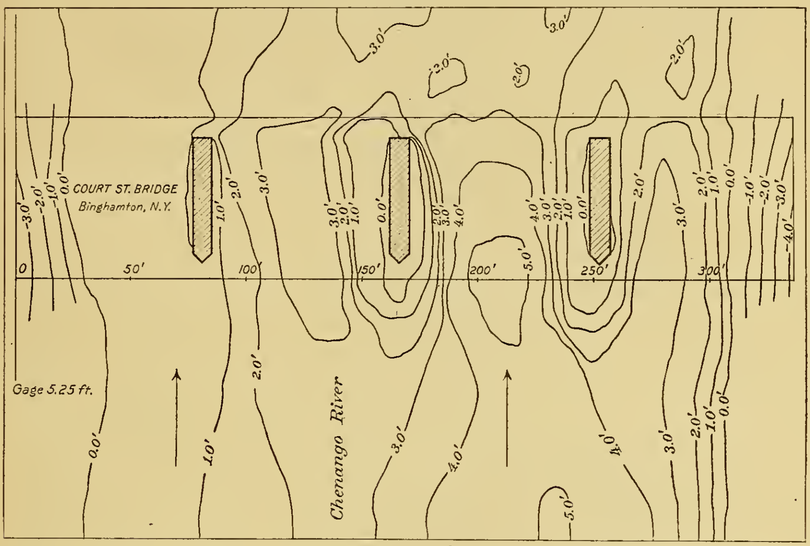


FIG. 4.—Contour of bottom of Chenango River at Court Street Bridge, Binghamton, N. Y.

station is at Court Street Bridge, Binghamton, where the observations were taken. The channel there is straight for about 1,000 feet on each side of the station, has a width of about 300 feet at low water and 340 feet at high water, and is broken by three piers. The bed is gravel and cobbles, with large rough stones around the piers. The bed is seen to be irregular in shape, as well as rough, but is permanent. The station is about 2,500 feet from Susquehanna River, and is subject to backwater at certain stages. Although the channel is

broken by three piers, the bridge projects over the piers on each side, so that the section of measurement is continuous.

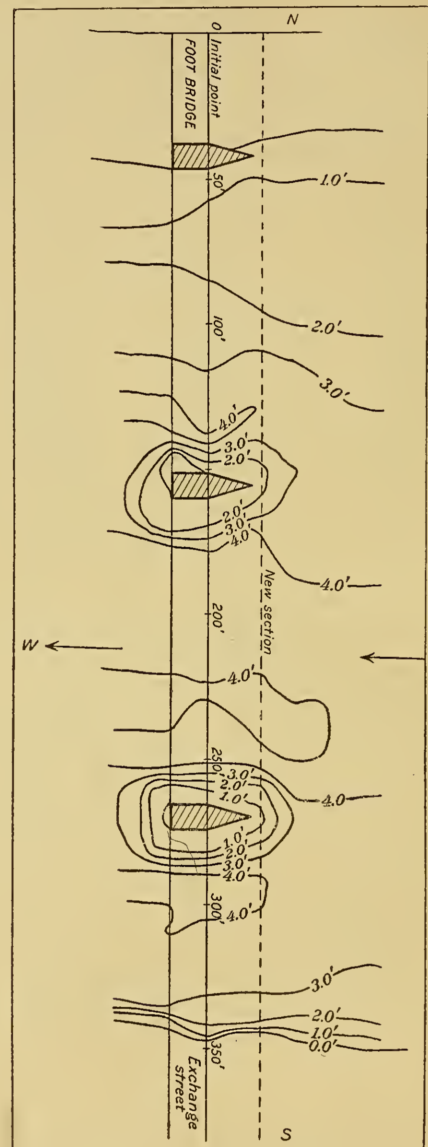


FIG. 5.—Contours of Susquehanna River bed at Exchange Street Bridge, Binghamton, N. Y.

At the Exchange Street Bridge, where the observations on Susquehanna River were made, the channel is straight for about 500 feet

above and below the station, has a width of about 300 feet at low water and about 450 feet at high water, broken by 3 piers. The bed is of gravel and cobbles, with large irregular-shaped-rock filling around the piers. The velocity is rather high, especially at the higher stages. About 900 feet above the station is a dam whose height is about 6 feet.

The methods of work and computations at each station were as follows: The vertical velocity curve observations consisted in measuring velocity at from three to five points in each of the verticals, the lowest point being one-half foot above the bed, and the highest 1 foot below the surface. Each observation covered four periods of 25 seconds each. The velocities computed from these observations were plotted on section paper, and a smooth curve was drawn among these called the velocity curve. These points gave, as a rule, a well-defined curve, except near the bottom, where the bed was rough.

The curves for each vertical were grouped according to gage height, so that the range for each group was not greater than 1 foot. A mean vertical velocity curve was then drawn for each group. In making these mean curves the means of the velocity at the surface and at each two-tenths depth of the original curves were used. The resulting mean curves are shown in figs. 6, 7, 8, and 9, and the deductions from these are given in the tables headed "Vertical Velocity Measurements on Susquehanna River at Binghamton, N. Y.," and "Vertical Velocity Curves on Chenango River at Binghamton, N, Y."

In the tables, top velocity means velocity one-half foot below the surface, and bottom velocity means velocity one-half foot above the bed. Columns 9, 10, and 11 give the mean velocities in each vertical, as obtained by three methods, and columns 12, 13, and 14 the coefficients for reducing velocities obtained by either of these methods to mean velocity as obtained from the vertical velocity curves.

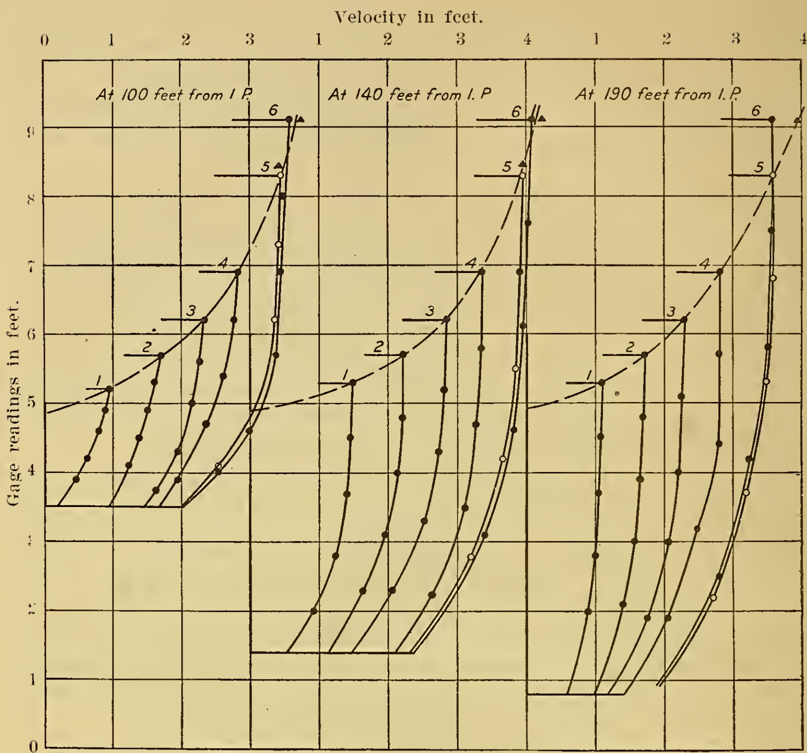


FIG. 6.—Mean vertical velocity curves, Chenango River, Binghamton, N. Y.

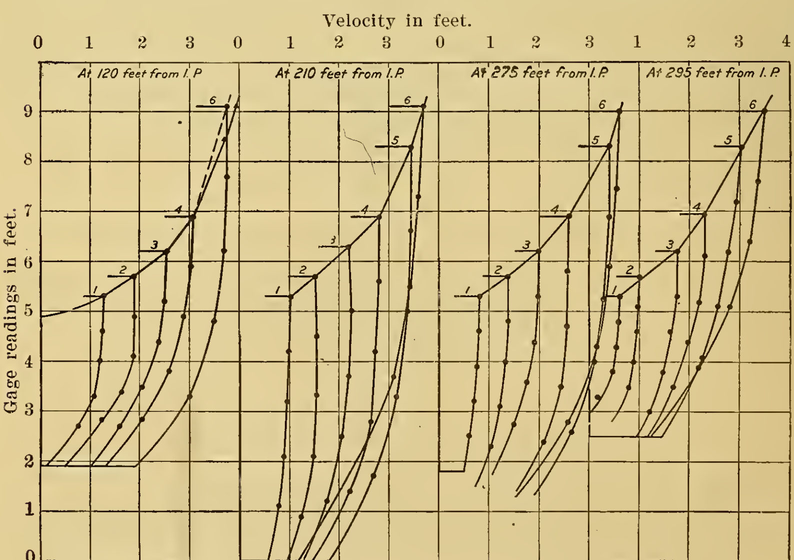


FIG. 7.—Mean vertical velocity curves, Chenango River, Binghamton, N. Y.

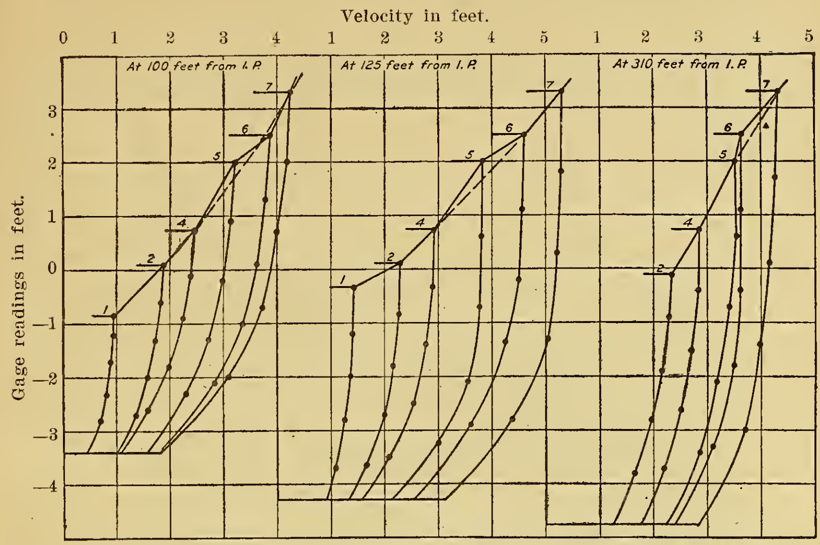


FIG. 8.—Mean vertical velocity curves, Susquehanna River, Exchange Street Bridge, Binghamton, N. Y.

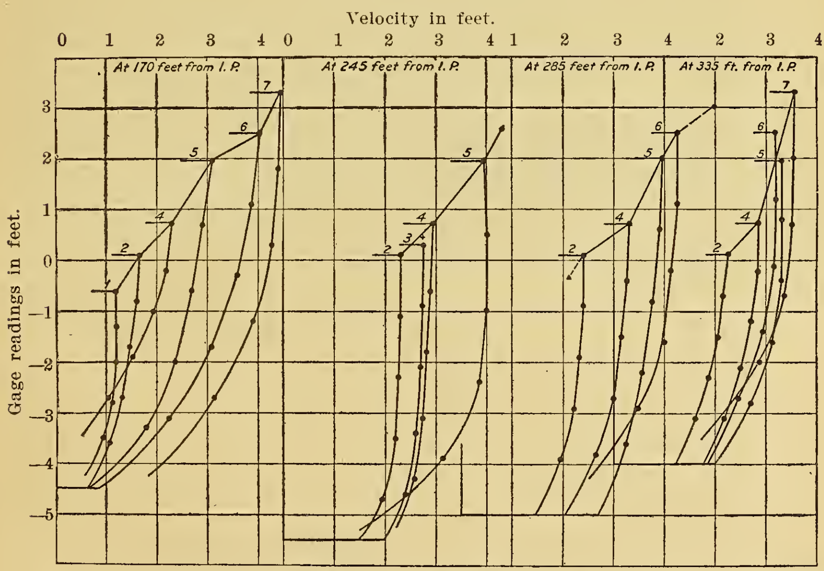


FIG. 9.—Mean vertical velocity curves, Susquehanna River, upper side of Exchange Street Bridge, Binghamton, N. Y.

Vertical velocity measurements on Chenango River, Binghamton, N. Y.

No. of curve.	Gage height.	Distance from initial point.	Depth.	Velocity in feet per second from the mean curves by following method:							Coefficient for reduction to mean velocity.			Position of thread of mean velocity.	Character of bed.
				Top.	Middle depth.	0.6 depth.	Bottom.	V. V. curve.	$\frac{T+B}{2}$	$\frac{T+2M+B}{4}$	0.6 depth.	$\frac{T+B}{2}$	$\frac{T+2M+B}{4}$	In per cent of depth.	
1	5.2	100	1.7	0.83	0.68	0.62	0.50	0.64	0.67	0.67	1.03	0.96	0.96	56	G
2	5.7	100	2.2	1.59	1.42	1.38	1.18	1.38	1.39	1.40	1.00	.99	.99	60	G
3	6.2	100	2.9	2.26	2.15	2.02	1.77	2.05	2.02	2.08	1.01	1.02	.98	60	G
4	6.9	100	3.4	2.77	2.55	2.42	1.97	2.43	2.37	2.46	1.00	1.03	.99	60	G
5	8.3	100	4.8	3.41	3.31	3.22	2.43	3.11	2.94	3.11	.97	1.06	1.00	67	G
1	5.3	140	3.9	1.45	1.35	1.27	.83	1.22	1.14	1.25	.96	1.07	.98	66	G
2	5.7	140	4.3	2.20	2.05	1.95	1.42	1.92	1.81	1.93	.98	1.06	.99	61	G
3	6.2	140	5.0	2.80	2.65	2.54	1.80	2.46	2.30	2.47	.97	1.07	1.00	61	G
4	6.9	140	5.5	3.35	3.20	3.10	2.43	3.03	2.89	3.05	.98	1.05	.99	65	G
5	8.3	140	6.9	3.90	3.75	3.73	2.67	3.53	3.29	3.52	.95	1.07	1.00	66	G
1	5.3	190	4.5	1.08	1.00	.97	.74	.94	.91	.95	.97	1.03	.99	61	G
2	5.7	190	4.9	1.70	1.60	1.50	1.12	1.50	1.46	1.53	1.00	1.03	.98	60	G
3	6.2	190	5.4	2.26	2.10	2.04	1.40	2.00	1.83	1.96	.98	1.09	1.02	63	G
4	6.9	190	6.1	2.80	2.67	2.45	1.63	2.44	2.22	2.44	1.00	1.10	1.00	60	G
5	8.3	190	7.4	3.54	3.35	3.20	2.02	3.14	2.78	3.06	.98	1.13	1.03	65	G
1	5.3	210	5.3	1.00	.95	.90	.66	.89	.83	.89	.99	1.07	1.00	60	G
2	5.7	210	5.7	1.59	1.52	1.49	1.05	1.43	1.32	1.42	.96	1.08	1.01	68	G
3	6.2	210	6.2	2.26	2.15	2.05	1.53	2.02	1.90	2.02	.99	1.06	1.00	63	G
4	6.9	210	6.9	2.80	2.70	2.65	1.80	2.53	2.30	2.50	.96	1.10	1.01	68	G
5	8.3	210	8.3	3.44	3.28	3.15	2.05	3.06	2.75	3.01	.97	1.11	1.02	64	G
1	5.3	120	3.4	1.26	1.13	1.05	.50	.98	.88	1.01	.93	1.11	.98	66	G
2	5.7	120	3.8	1.90	1.80	1.62	.93	1.65	1.22	1.61	1.02	1.03	1.03	59	G
3	6.2	120	4.3	2.53	2.30	2.09	1.37	2.10	1.95	2.12	1.00	1.08	.99	60	G
4	6.9	120	5.0	3.06	2.77	2.62	1.70	2.60	2.38	2.58	.99	1.09	1.01	62	G
1	5.3	275	3.5	.80	.73	.70	.58	.70	.69	.71	1.00	1.01	.99	60	B
2	5.7	275	4.2	1.41	1.29	1.23	.89	1.19	1.15	1.22	.97	1.04	.99	65	B
3	6.2	275	4.4	1.97	1.83	1.76	1.29	1.76	1.63	1.78	1.00	1.08	.99	60	B
4	6.9	275	5.4	2.58	2.52	2.44	1.89	2.38	2.24	2.38	.97	1.06	1.00	67	B
5	8.3	275	6.9	3.40	3.22	3.13	2.22	3.06	2.81	3.02	.98	1.09	1.01	65	B
1	5.3	295	2.3	.58	.53	.49	.34	.46	.46	.48	.94	1.00	.96	65	G
2	5.7	295	2.9	.98	.92	.86	.60	.87	.79	.86	1.01	1.10	1.01	55	G
3	6.2	295	3.7	1.75	1.59	1.52	1.20	1.52	1.48	1.53	1.00	1.03	.99	60	G
4	6.9	295	4.4	2.30	2.06	1.95	1.47	1.97	1.89	1.97	1.01	1.05	1.00	59	G
5	8.3	295	5.8	2.98	2.60	2.47	1.75	2.50	2.37	2.48	1.01	1.06	1.01	59	G
Mean	-------	----	----	-----	-----	-----	-----	-----	-----	-----	.984	1.041	.996	65.6	

NOTE.—"No. of curve" refers to figs. 6 and 7.

Vertical velocity measurements on Susquehanna River, Binghamton, N. Y.

No. of curve.	Gage height.	Distance from initial point.	Depth.	Velocity in feet per second from the mean curves by following method—							Coefficient for reduction to mean velocity.			Position of thread of mean velocity.	Character of bed.
				Top.	Middle depth.	0.6 depth.	Bottom.	V. V. curve.	$\frac{T+B}{2}$	$\frac{T+2M+B}{4}$	0.6 depth.	$\frac{T+B}{2}$	$\frac{T+2M+B}{4}$	In per cent of depth.	
1	−0.85	100	2.5	0.94	0.82	0.81	0.66	0.80	0.80	0.81	0.99	1.00	0.99	61	G
2	+ .10	100	3.5	1.85	1.65	1.52	1.27	1.58	1.56	1.60	1.04	1.01	1.03	57	G
4	+ .73	100	4.1	2.42	2.20	1.99	1.42	2.03	1.92	2.05	1.02	1.06	.99	56	G
5	+2.00	100	5.4	3.20	2.87	2.74	1.90	2.71	2.55	2.71	.99	1.06	1.00	61	G
6	+2.50	100	5.9	3.84	3.50	3.35	2.23	3.26	3.02	3.27	.97	1.08	1.00	61	G
7	+3.30	100	6.7	4.22	3.87	3.72	2.35	3.58	3.29	3.58	.96	1.09	1.00	64	G
1	− .30	125	4.0	1.42	1.32	1.26	1.05	1.27	1.24	1.28	1.01	1.03	.99	56	G
2	+ .10	125	4.4	2.29	2.10	2.03	1.57	2.03	1.93	2.02	1.00	1.05	1.00	60	G
4	0.73	125	5.0	2.92	2.70	2.59	1.90	2.57	1.41	2.56	.99	1.11	1.00	61	G
5	2.00	125	6.3	3.82	3.74	2.63	2.55	3.48	3.19	3.46	.96	1.09	1.01	63	G
6	2.50	125	6.8	4.58	4.40	4.20	2.95	4.10	3.77	4.08	.98	1.09	1.00	65	G
7	3.30	125	7.6	5.29	5.15	5.04	3.60	4.86	4.45	4.80	.96	1.09	1.01	65	G
2	− .10	310	4.7	2.30	2.06	1.95	1.48	1.98	1.89	1.97	1.01	1.05	1.00	60	G
4	.73	310	5.5	2.85	2.62	2.53	2.00	2.53	2.42	2.52	1.00	1.05	1.00	60	G
5	+2.00	310	6.8	3.52	3.32	3.15	2.51	3.18	3.02	3.17	1.01	1.05	1.00	60	G
6	2.50	310	7.3	3.63	3.57	3.43	2.65	3.37	3.14	3.35	.98	1.07	1.01	66	G
7	3.30	310	8.1	4.30	4.05	3.97	3.13	3.93	3.72	3.88	.99	1.06	1.02	63	G
1	− .60	170	3.6	1.20	1.15	1.10	.85	1.08	1.02	1.09	.98	1.06	.99	61	B
2	+ .10	170	4.6	1.65	1.40	1.30	.90	1.34	1.27	1.34	1.03	1.06	1.00	56	B
4	+ .73	170	4.2	2.24	1.75	1.57	.85	1.67	1.55	1.65	1.06	1.08	1.01	55	B
5	2.00	170	6.5	3.02	2.53	2.40	1.20	2.36	2.11	2.34	.98	1.12	1.01	62	B
6	2.50	170	7.0	3.98	3.32	3.07	1.47	3.08	2.73	3.02	.00	1.13	1.02	60	B
7	3.30	170	7.5	4.45	4.12	3.90	2.35	3.79	3.40	3.76	.97	1.11	1.01	64	B
2	+ .10	245	5.6	2.30	2.23	2.20	1.80	2.16	2.05	2.14	.98	1.05	1.01	66	G
3	+ .30	245	5.8	2.76	2.65	2.62	2.25	2.60	2.50	2.58	1.00	1.04	1.01	60	G
4	+ .70	245	6.0	2.94	2.80	2.75	2.45	2.78	2.70	2.75	1.01	1.03	1.01	58	G
5	2.00	245	7.5	3.96	3.95	3.78	2.20	3.59	3.08	3.51	.95	1.17	1.02	68	G
2	+0.10	285	5.1	2.45	2.26	2.19	1.69	2.16	2.07	2.16	.99	1.04	1.00	61	R
4	.73	285	5.7	3.30	3.05	3.00	2.32	2.95	2.81	2.93	.98	1.05	1.01	63	R
5	2.00	285	7.0	3.93	3.65	3.55	2.88	3.55	3.40	3.53	1.00	1.04	1.01	60	R
6	2.50	285	6.8	4.25	4.05	3.95	2.92	3.86	3.59	3.82	.98	1.08	1.01	63	R
2	+ .10	335	4.1	2.20	1.95	1.85	1.45	1.88	1.83	1.89	1.01	1.03	1.00	59	G
4	.73	335	4.7	2.85	2.61	2.50	2.01	2.52	2.43	2.52	1.01	1.04	1.00	58	G
5	2.00	335	6.0	3.30	3.20	3.10	2.33	3.03	2.82	3.01	.98	1.08	1.01	63	G
6	2.50	335	6.5	3.18	3.05	2.87	2.12	2.86	2.65	2.85	1.00	1.08	1.00	60	G
7	3.30	335	6.8	3.55	3.44	3.35	2.15	3.18	2.85	3.15	.95	1.11	1.01	66	G
Mean	--------	-----	-----	------	------	------	------	------	------	------	.992	1.068	1.005	61.2	

NOTE.—" No. of curve " in column 1 refers to figs. 8 and 9.

From the curves and table for Chenango River it is seen that the value of the coefficient for reducing velocity obtained by the six-tenths-depth method varies from 0.93 to 1.03, the mean being 0.984. The coefficient for reducing velocity obtained by the top and bottom method to that obtained from the vertical velocity curve varies from 0.96 to 1.13, the mean being 1.041, the error of this method increasing as the depth increases. The coefficient for reducing velocity obtained by the third method to mean velocity obtained from the vertical velocity curve varies from 0.96 to 1.03, the mean being 0.996.

From the curves and table for Susquehanna River it is seen that the coefficient for reducing velocity at six-tenths depth to mean velocity obtained from vertical velocity curves varies from 0.95 to 1.06, the mean being 0.992. The coefficient for reducing velocity by the top and bottom method varies from 1 to 1.17, the mean being 1.068. The coefficient for reducing velocity obtained by the third method to mean velocity varies from 0.99 to 1.03, the mean being 1.005.

It is seen from the result in these tables: (1) That the third method of obtaining mean velocity by observing velocity one-half foot above the bed and one-half foot beneath the surface and at mid depth gives results agreeing very closely with that obtained from vertical velocity curves if the bed is smooth; (2) that results obtained by the top and bottom method agree quite closely with those obtained from vertical velocity curves if the depth is small and bed smooth, and that the error by this method increases as the depth increases; (3) that velocities obtained by the six-tenths-depth method are somewhat larger than those obtained from vertical velocity curves if the average depth is greater than about 4 feet.

The series of vertical velocity measurements made at Harrisburg were taken on November 2, 1903. They consisted of 20 measurements at depths ranging from 3 to 8 feet and mean velocity varying from 1.5 to 2.6 feet per second. The results of these measurements are shown in the following table and by the curves on Pl. XXVI.

Vertical velocity measurements made on Susquehanna River at Harrisburg, Pa., November 2, 1903.

Distance from initial point, in feet.	Depth at measuring point, in feet.	Velocity in feet per second by following methods.					Coefficients for reducing to mean velocity.				Depth of thread of mean velocity.	
		Vertical velocity.	Six-tenths.	Top and bottom.	Integration.	Top.	Six-tenths.	Top and bottom.	Integration.	Top.	In feet.	In per cent of depth.
140	3.2	2.00	1.96	------	1.92	------	1.02	------	1.04	------	2.0	62
120	4.3	1.52	1.79	1.83	1.74	1.96	.85	0.83	.87	0.78	2.8	65
220	4.3	1.95	1.98	------	2.08	------	.99	------	.94	------	2.6	60
200	4.7	1.85	1.67	------	1.93	------	1.11	------	.96	------	2.6	55
160	4.8	1.82	1.87	------	1.74	------	.97	------	1.05	------	3.3	69
180	5.0	1.67	1.70	------	1.74	------	.98	------	.96	------	2.9	58
260	5.2	2.02	2.05	1.68	2.01	2.37	.99	1.21	1.00	.85	3.6	69
320	5.4	2.55	2.88	2.34	2.64	2.92	.89	1.09	.97	.87	3.9	72
280	5.8	2.15	1.73	2.00	2.06	2.67	1.24	1.07	1.04	.81	3.6	62
340	5.9	2.57	2.62	2.72	2.80	2.83	.98	.95	.92	.91	3.5	59
380	6.0	2.63	2.35	2.81	2.62	3.02	1.12	.94	1.00	.87	3.9	65
300	6.0	2.44	2.48	2.57	2.37	2.79	.98	.95	1.03	.87	3.7	62
360	6.1	2.71	2.85	2.75	2.72	2.99	.95	.99	1.00	.91	3.7	61
560	7.6	2.16	2.28	2.14	2.31	2.63	.95	1.01	.94	.82	4.6	61
590	7.7	2.40	2.40	2.34	2.41	2.92	1.00	1.02	1.00	.82	4.3	56
540	7.9	2.18	2.09	2.23	2.29	2.87	1.04	.98	.95	.76	4.4	56
520	8.0	2.57	2.73	2.66	2.52	3.08	.94	.97	1.02	.83	5.2	65
585	8.0	2.48	2.28	2.42	2.62	2.85	1.09	1.02	.95	.87	4.6	58
580	8.0	2.48	2.33	2.32	2.46	2.80	1.06	1.07	1.01	.89	4.1	51
580	8.0	2.49	2.49	------	2.48	------	1.00	------	1.00	------	5.5	60
Mean							1.01	1.08	.98	.85	-----	61

From these observations at Harrisburg we find, first, that the depth of the thread of mean velocity ranges from 51 to 72 per cent of the total depth and that the mean is 61 per cent. The error, therefore, introduced by holding the meter at 0.6 depth is only about 1 per cent. Second, the mean coefficient found for reducing top and bottom velocities to mean velocities is 1.08. Third, the coefficient for reducing velocities by the integration method to mean velocity is 0.98. Fourth, the coefficient for reducing top velocity to mean velocity is 0.85.

An interstudy of these various series of vertical velocity measurements shows that at these stations for depths up to about 10 feet and velocities not over 5 feet per second the depth of the thread of mean velocity is practically 60 per cent of the total depth, while for depths over 10 feet and velocities over 5 feet per second the depth of the thread of mean velocity becomes greater, averaging about 70 per cent of the total depth.

The coefficient for reducing top velocities to mean velocity for depths under 10 feet and velocities under 5 feet is about 0.85, while for greater depths and velocities it increases to a maximum of about 0.92.

The top and bottom velocities invariably give too small results, depending upon the roughness of the bed.

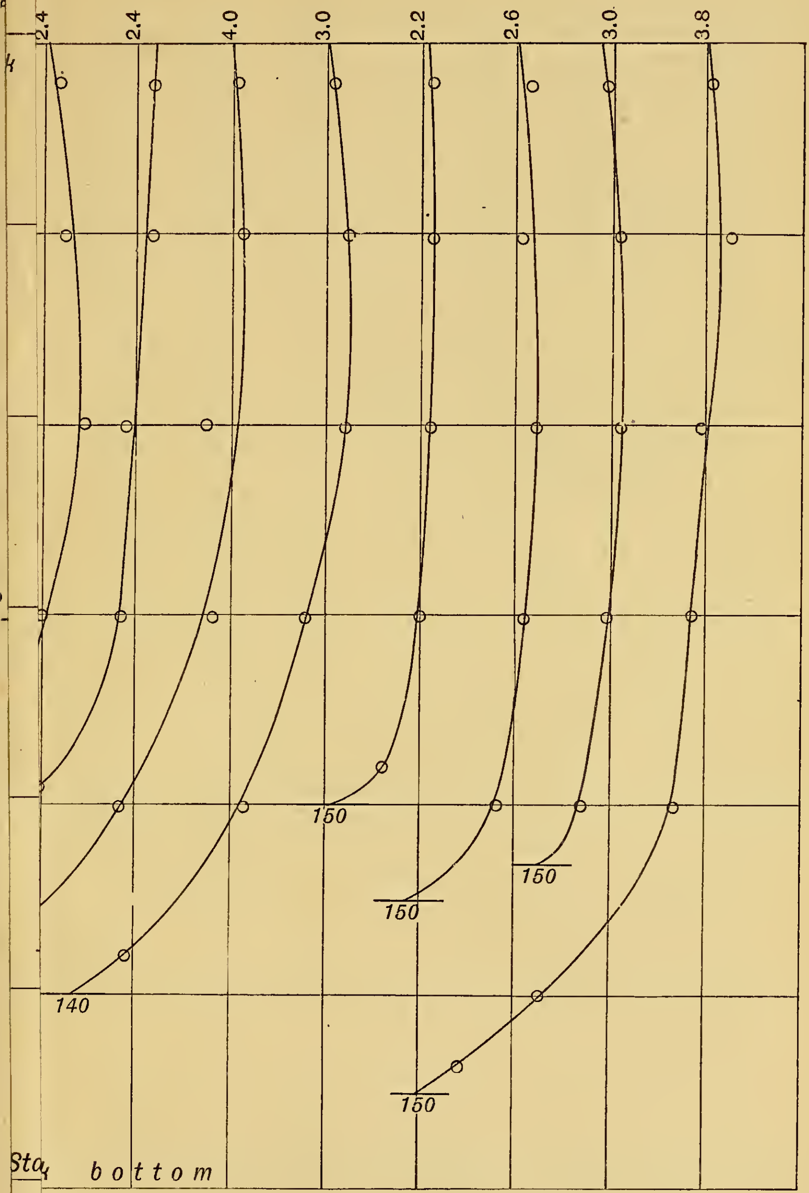
Furthermore, it is found that although the depth of the thread of mean velocity may vary between 50 and 80 per cent of the total depth, the error caused by holding the meter at 60 per cent of the depth does not exceed 5 or 6 per cent, which is within the limits of the accuracy one can expect in stream-measurement work.

The following table gives a summary of the results of the various series of vertical velocity measurements in the Susqehanna drainage:

Summary of results of vertical velocity measurements.

Place.	Number of curves.	Range of depths.	Range of velocities.	Depth of thread of mean velocity in per cent of depth.	Coefficient for reducing to mean velocity.				
					Six-tenths.	Top and bottom.	Top.	$\frac{T+2M+B}{4}$	Integration.
		Feet.	*Ft. per sec.*						
McCalls Ferry, Duncan Run	73	3.3-30.0	1.21-5.80	68	0.94	1.07	0.92	......	......
McCalls Ferry, cable station	68	5.0-36.0	1.40-9.70	72	.97	......	.90	......	......
Binghamton (Susquehanna River)	36	2.5- 8.1	.80-4.86	61	.99	1.07	......	1.00	......
Binghamton (Chenango River)	34	1.7- 8.3	.46-3.38	66	.98	1.04	......	1.00	......
Harrisburg (Susquehanna River)	20	3.2- 8.0	1.52-2.71	61	1.01	1.08	.85	......	0.98

NOTE.—In the above table erratic observations were not used.



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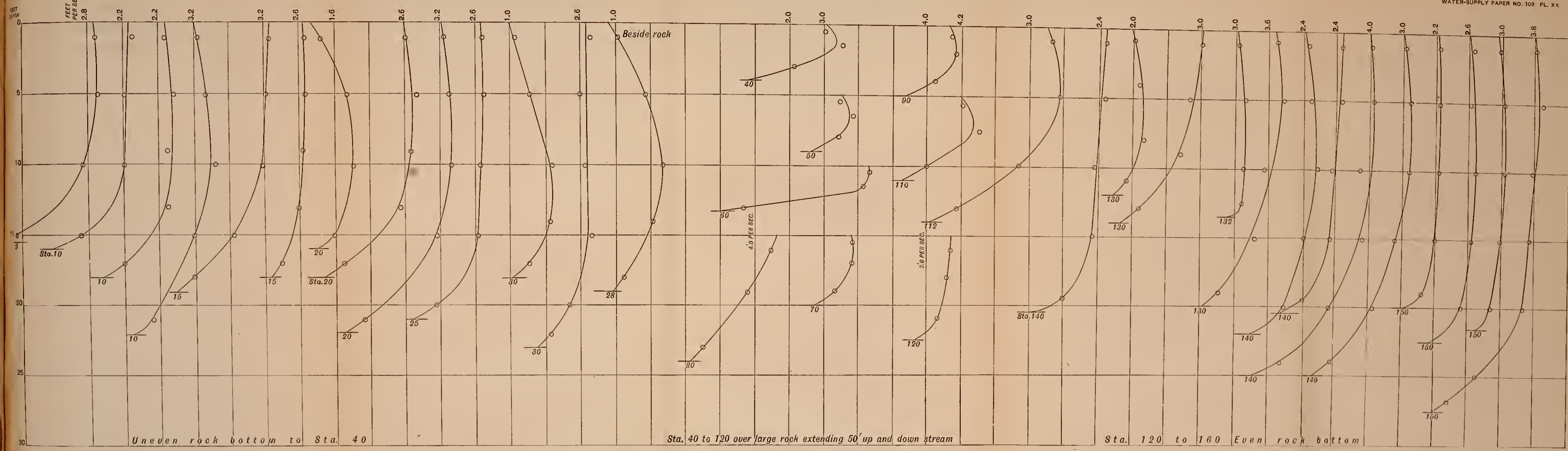
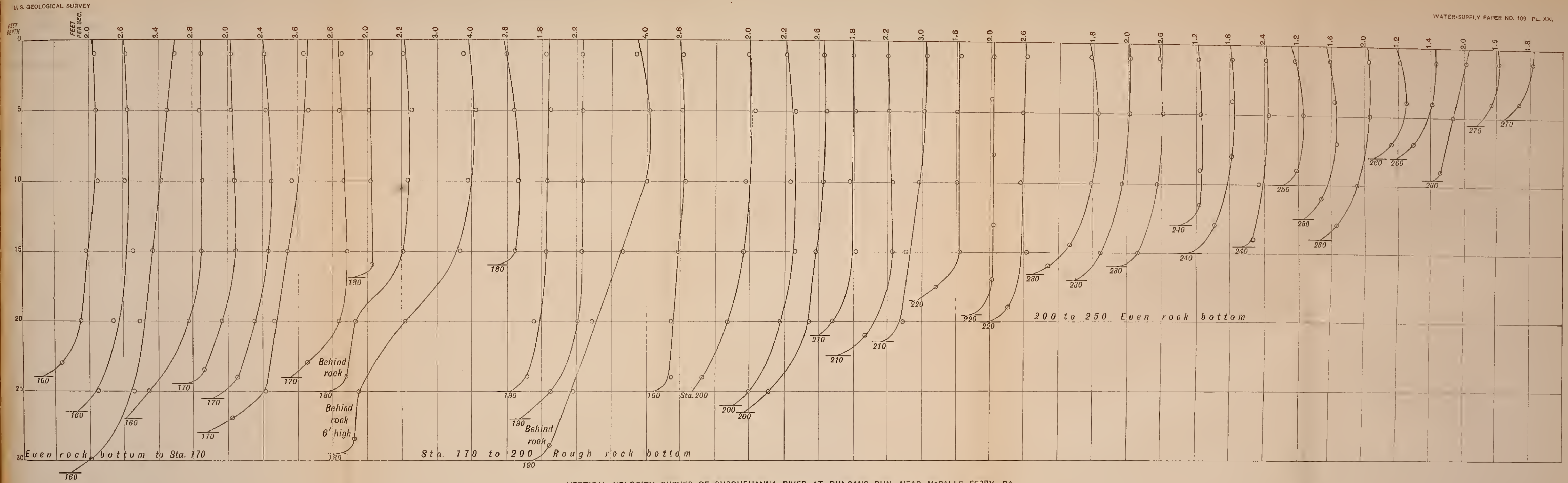
at 1 inch=5 feet depth.



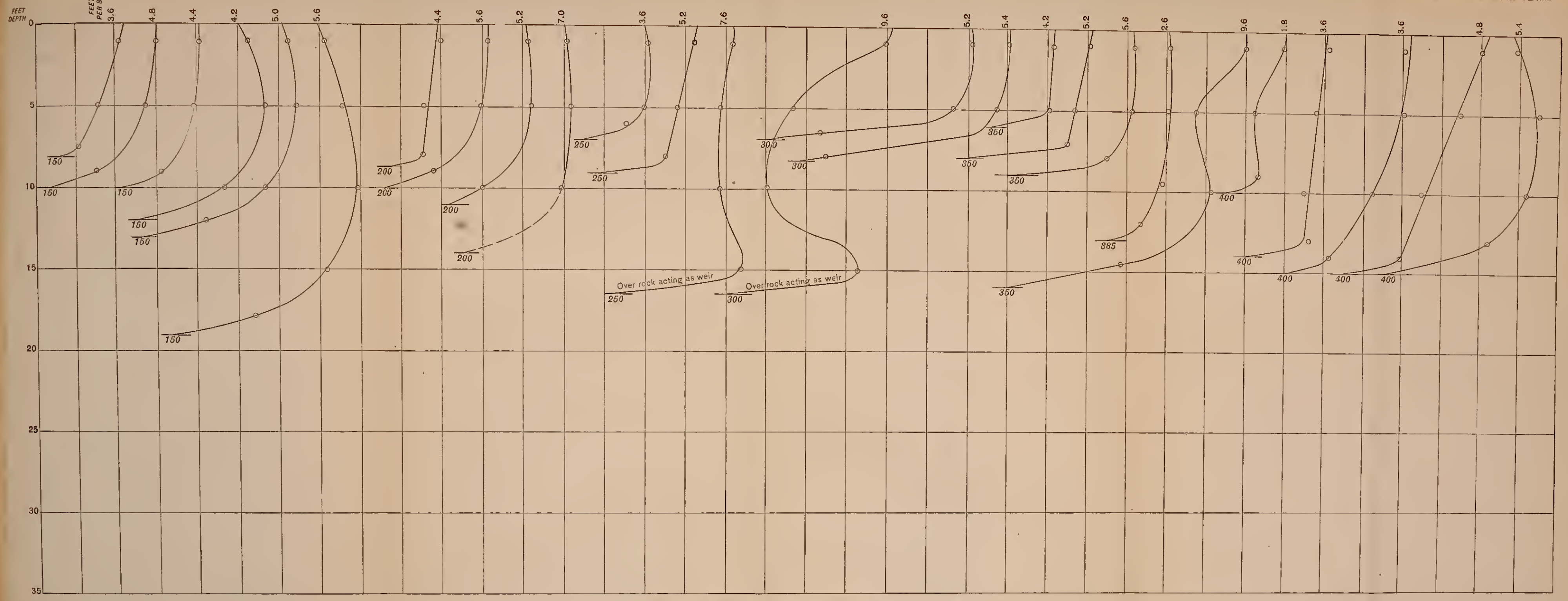
VERTICAL VELOCITY CURVES OF SUSQUEHANNA RIVER AT DUNCANS RUN, NEAR McCALLS FERRY, PA.

Note: Curves are referred to the vertical lines nearest their tops. Station numbers are at the foot of the curves. Horizontal lines at the foot of the curves are at the river bottom. The curves terminate at their tops with the surface of the water. Horizontal scale, 1 inch=2 feet per second Vertical scale, 1 inch=5 feet depth.



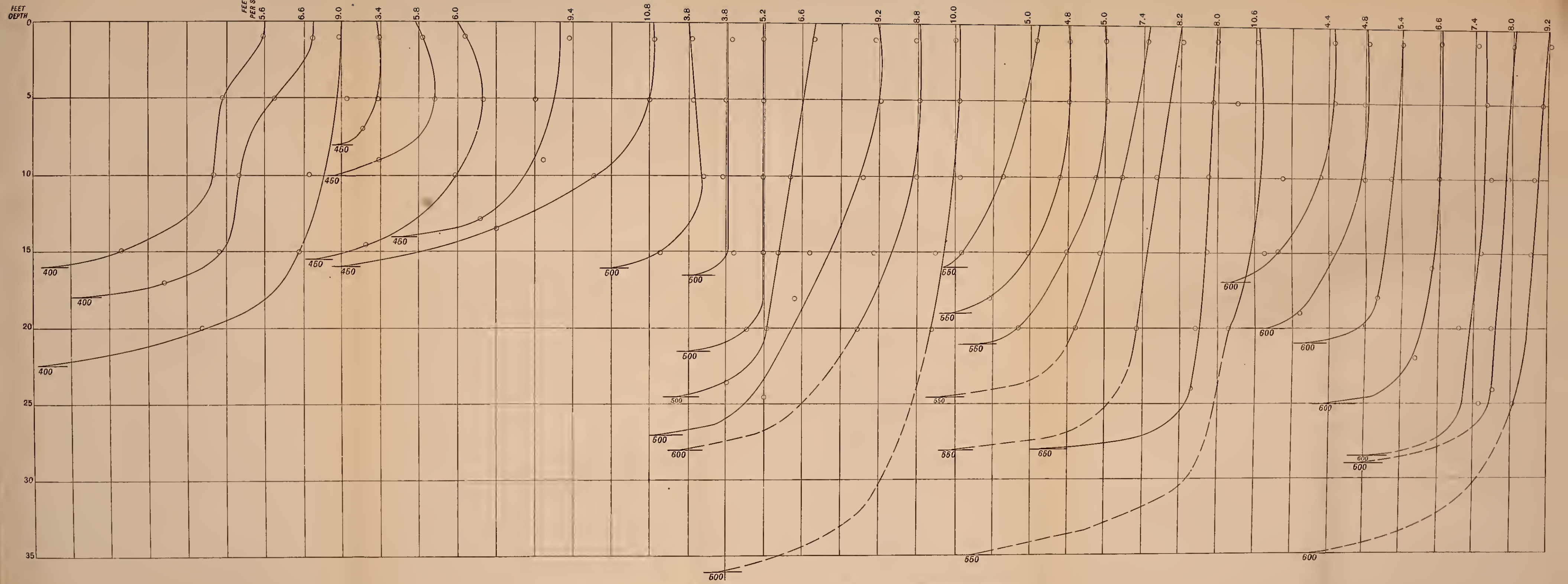
VERTICAL VELOCITY CURVES OF SUSQUEHANNA RIVER AT DUNCANS RUN, NEAR McCALLS FERRY, PA.

Note: Curves are referred to the vertical lines nearest their tops. Station numbers are at the foot of the curves. Horizontal lines at the foot of the curves are at the river bottom. The curves terminate at their tops with the surface of the water. Horizontal scale, 1 inch=2 feet per second. Vertical scale, 1 inch=5 feet depth.



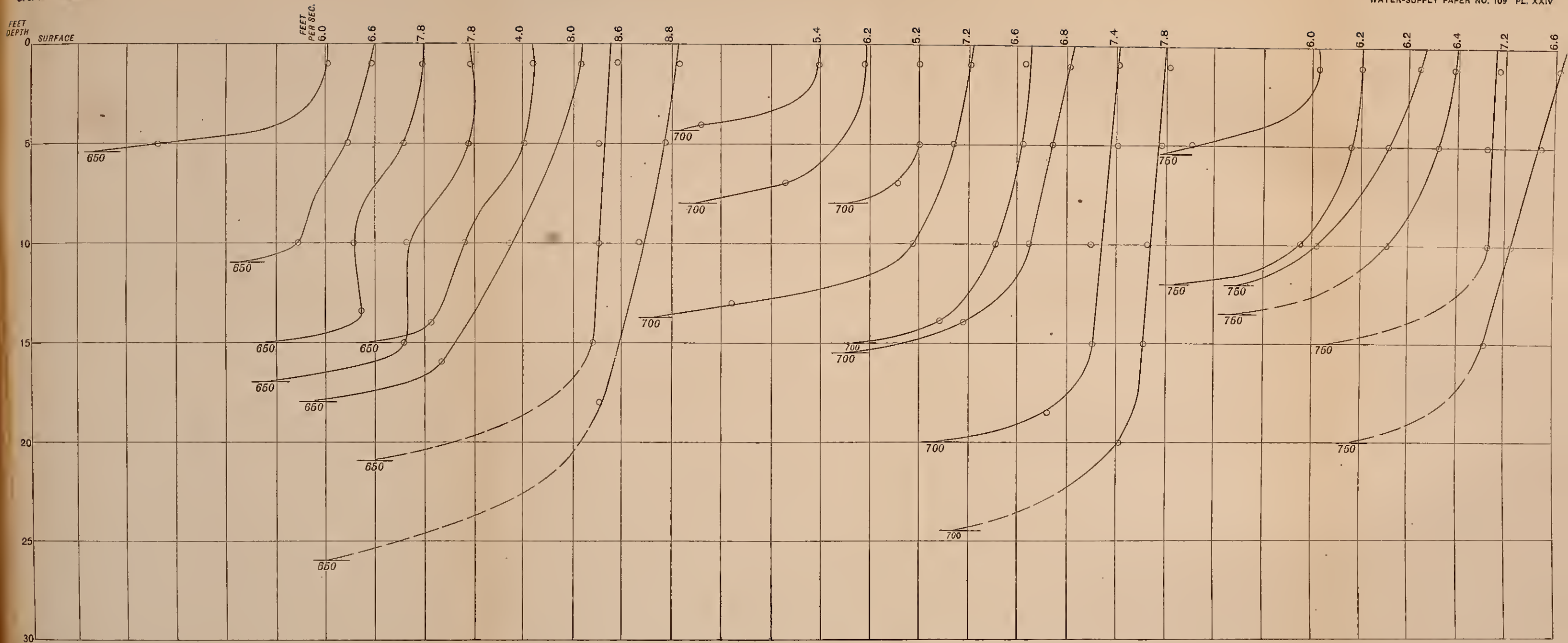
VERTICAL VELOCITY CURVES OF SUSQUEHANNA RIVER AT CABLE STATION NEAR McCALLS FERRY, PA.

Note: Curves are referred to the vertical lines nearest their tops. Station numbers are at the foot of the curves. Horizontal lines at the foot of the curves are at the river bottom. The curves terminate at their tops with the surface of the water. Horizontal scale, 1 inch=2 feet per second. Vertical scale, 1 inch=5 feet depth.



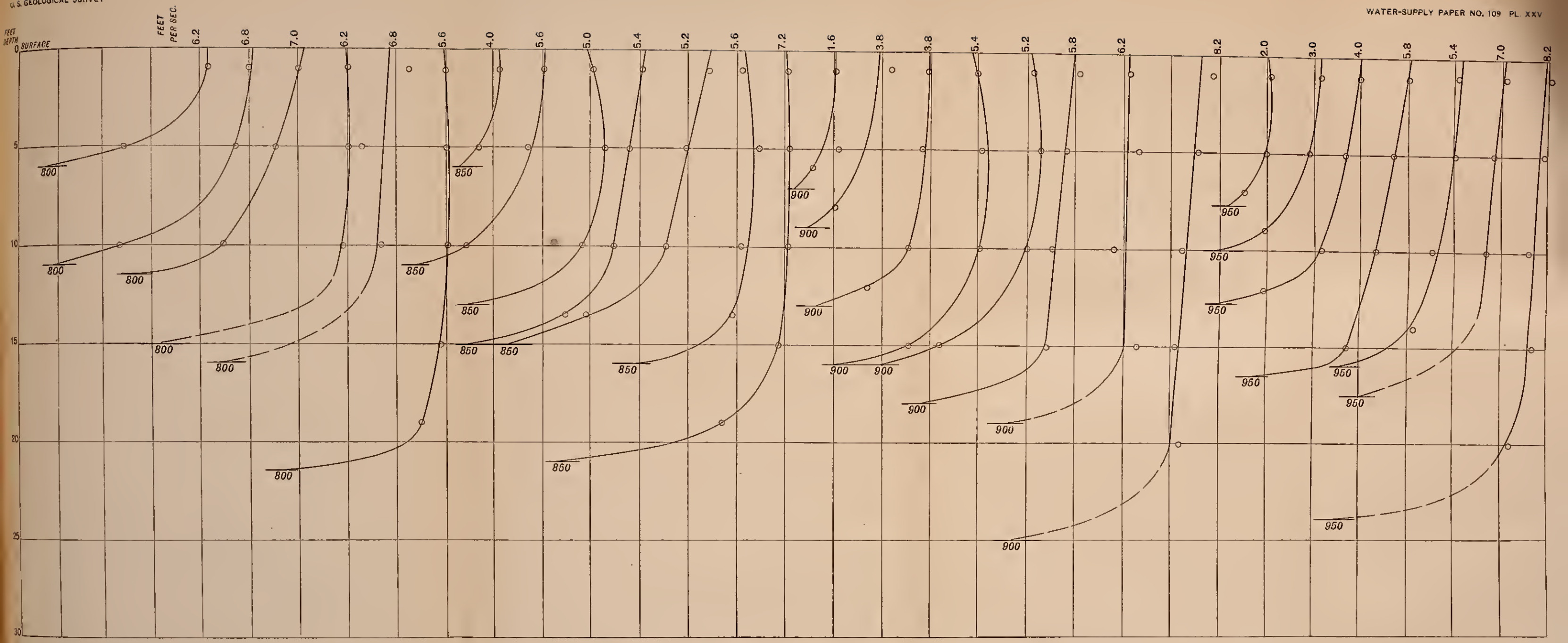
VERTICAL VELOCITY CURVES OF SUSQUEHANNA RIVER AT CABLE STATION NEAR McCALLS FERRY, PA.

Note: Curves are referred to the vertical lines nearest their tops. Station numbers are at the foot of the curves. Horizontal lines at the foot of the curves are at the river bottom. The curves terminate at their tops with the surface of the water. Horizontal scale, 1 inch=2 feet per second. Vertical scale, 1 inch=5 feet depth



VERTICAL VELOCITY CURVES OF SUSQUEHANNA RIVER AT CABLE STATION NEAR McCALLS FERRY, PA.

Note: Curves are referred to the vertical lines nearest their tops. Station numbers are at the foot of the curves. Horizontal lines at the foot of the curves are at the river bottom. The curves terminate at their tops with the surface of the water. Horizontal scale, 1 inch=2 feet per second. Vertical scale, 1 inch=5 feet depth.



VERTICAL VELOCITY CURVES OF SUSQUEHANNA RIVER AT CABLE STATION NEAR McCALLS FERRY, PA.

Note. Curves are referred to the vertical lines nearest their tops. Station numbers are at the foot of the curves. Horizontal lines at the foot of the curves are at the river bottom. The curves terminate at their tops with the surface of the water. Horizontal scale, 1 inch=2 feet per second. Vertical scale, 1 inch=5 feet depth.

WATER POWER.

GENERAL DISCUSSION.

In marked contrast to the New England streams, the power resources of the Susquehanna River basin, one of the largest draining into the Atlantic Ocean, are little developed.

As shown by the tables on pages 204, 205, taken from schedules furnished by the manufacturers' division of the Twelfth Census, 1900, a maximum of 10,375 horsepower is utilized in the portion of the drainage area in New York and 38,812 horsepower in Pennsylvania. This makes a total of less than 50,000 horsepower—an amount which, according to the estimates of various engineers, can be developed at any of several points on the lower river. By far the greater part of this is developed intermittently upon the smaller tributary streams by mills of from 20 to 50 horsepower. Pls. XXVIII and XXIX show the profile of Susquehanna River and its principal tributaries. These profiles are made up from data obtained from the army engineers, the report of the Tenth Census, Vol. XVI, and from levels furnished by private engineers, as shown in the tables on pages 207–210.

Over the greater portion of the river above Harrisburg the fall per mile is from 1 to 2 feet, while below Harrisburg the fall increases to between 5 and 8 feet, and it is here that the greatest opportunities for large power developments exist. The only point on the entire river at which this fall is now being utilized to any great extent is at York Haven, where a paper mill uses 2,000 horsepower, and a large electric-power plant in course of construction will soon use 10,000 or 20,000 more.

Mr. W. F. Bay Stewart, of York, Pa., describes the York Haven Power Plant, as follows:

The York Haven Water and Power Company's plant is located at the foot of the Conewago Falls on the Susquehanna River, ten miles from York and sixteen miles below Harrisburg. The natural fall at this point is about 23 feet in about three-quarters of a mile. The method of utilizing this fall is by building a wing dam out into the river above the falls and turning the greater portion of the flow by means of this wing dam within a retaining wall 3,500 feet long, constructed of masonry. This wall is built along the river shore just above low water. The wall is 16 feet high at the upper end and 32 feet high at the lower end, it is 6 feet wide on top all the way, and is built vertical on the inside and with a batter on the outside toward the river. The width of the foundation increases with the height of the wall. so that at the lower end it is about 22 to 24 feet in width. It is built of rubble masonry laid in cement.

The power house begins at the lower end of this wall, and is about 50 feet wide and 480 feet long. It contains twenty full-sized chambers and one smaller chamber. The design is to install in each of these chambers two 600-horsepower water wheels, and to connect the shafts of these water wheels by means of beveled gears at their top with the shaft of a 750-kilowatt generator, which runs horizontally and which is intended to develop at least 1,000 horsepower. To

equip the plant will require forty 600-horsepower water wheels and twenty generators. In addition to this, in the smaller chamber there will be installed two 300-horsepower water wheels which drive two exciters, duplicates, either one of which is capable of exciting the whole plant. This building up to a height of 34 feet is of the same class of masonry as the retaining wall, and these chambers for water wheels are practically openings in an otherwise solid mass of masonry 480 feet long by 50 feet wide and 34 feet high. On top of this foundation is a brick building, one portion of which is two story and the remaining, one story. In the two-story part the switch boards and controlling devices are located. At the lower end of this building and at right angles to it another wall is constructed the same height as the high part of the retaining wall and about 170 feet long. This wall then extends in an irregular form around the buildings of the York Haven Paper Company's plant to the main land. On the angle of this wall is constructed a tranformer house sufficient to receive the machinery for transforming all the current generated in the generating plant. The current is developed at 2,400 volts and stepped up to 24,000 volts in this transformer house and is transmitted at this voltage to points of consumption. The company has built a transmission line capable of transmitting 6,000 horsepower from York Haven to York, where another transformer house has been built capable of transforming 24,000 volt current down to 2,200 volts, at which voltage it will be delivered to customers. It is the purpose of the company to build a like transmission line to Harrisburg, with a like transformer house at that city, and, possibly, also to Lancaster, Pa., which is about 20 miles from the plant. The machinery installed and to be installed in this plant is capable of an overload of 25 per cent, thus increasing the capacity to 25,000 horsepower, and of course it could be more largely increased by raising the head.

Between York Haven and the mouth of the river there is a fall of about 270 feet. The mean annual discharge at York Haven from 1891 to 1904, inclusive, is about 40,000 second-feet. By applying the rule that 11 second-feet of water falling 1 foot equals a horsepower with 80 per cent efficiency it is seen that between York Haven and the outlet of the river there about one million horsepower running to waste, though several neighboring cities would afford an eager market for all that could be developed. There are, of course, several obstacles in the way of development, perhaps the most serious of which would be the occasional ice freshets and gorges, making substantial protective works necessary and reducing or obliterating the available head. Between the narrows above McCalls Ferry and Port Deposit, however, the ice passes down through either a deep or a broad channel, with no tendency to gorge and seldom doing damage. At present there are several individuals and companies who are promoting power schemes on the lower river, and a large plant at York Haven has recently been completed.

Mr. H. F. Labelle, who spent several years in the study of the power possibilities of the lower Susquehanna, states the following in regard to the power developments on the lower Susquehanna River:

The bed of the stream from Columbia to Port Deposit is for the most part very wide, varying from 3,500 feet to about 2½ miles opposite Washingtonboro There are, however, a few "narrows," as at Conowingo and McCalls Ferry. The stream being wide and rapid, it naturally follows that at low water it is very shallow and can be forded in many places. The water in the narrows is, how-

ever. very deep. At Conowingo Bridge, on the west side, there is a narrow channel over one-half mile long in which depths of 75 feet have been found. At McCalls Ferry, where the river narrows to about 300 feet, the depth is also considerable. These deep channels are also met here and there on the wider parts of the river—namely, between Turkey Hill and Star Rock station, on the east side, where depths of over 90 feet have been found.

The Susquehanna and Tide-water canal skirts the west side of the river from Wrightsville to Havre de Grace. Before the building of the Philadelphia, Baltimore and Washington Railroad and the Frederick Branch of the Pennsylvania Railroad this canal had a brisk carrying trade, chiefly in coal from the anthracite regions. The flood of June, 1889, wrecked the canal in many places. The cost of repairs was very high, and the canal continued in operation until May, 1894, when another flood caused considerable damage to the property. Since that time it has been practically out of operation. After changing hands several times, it was finally bought by the Susquehanna Electric Power Company, of Baltimore. This company is about to begin the construction of their first plant, below Peach Bottom. The Frederick Branch of the Pennsylvania Railroad runs on the west side of the river from Columbia to Perryville, where it connects with the main line of the Philadelphia, Baltimore and Washington Railroad.

The minimum discharge of the river at Shures Landing can be taken safely at 6,000 second-feet. This would give a minimum gross power to be developed from Columbia to tide water of 153,000 horsepower. The proposed plants, however, have been designed for a supply of 10,000 second-feet, which is available most of the time.

This would give a possible power of about 255,000 horsepower. This available power can almost be totally utilized, and the writer knows of projects on the river aggregating over 185,000 horsepower.

The power available on the Susquehanna has at its disposal a much better market than any other in the United States, not barring Niagara Falls. Baltimore is a little more than 40 miles from the half of the minimum power and Philadelphia is within 65 miles of the two lower plants, taking on the way Wilmington, with its heavy power consumption.

The upper plants are within easy reach of Lancaster, York, Harrisburg, Reading, and other manufacturing centers. Eastern Pennsylvania, with its great manufacturing activity, will surely avail itself of whatever amount of power can be developed on the river, and towns like Havre de Grace (10 miles below Shures Landing), located on two of the large trunk lines between the North and the South and also at the head of Chesapeake Bay, can be transformed by cheap power into manufacturing centers of no mean importance.

There is no doubt that with the help of steam plants—and there are many already established in the larger cities of the district—400,000 horsepower could be developed on the river below Columbia and find a ready and remunerative market.

Starting from tide water the principal plants projected are as follows: (1) Conowingo plant, 25,000 to 35,000 horsepower; (2) the Peach Bottom plant, 40,000 horsepower; (3) the Fites-Eddy plant, 40,000 horsepower; (4) the York Furnace, McCalls Ferry plant, 45,000 horsepower; (5) the Turkey Hill plant, 30,000 horsepower.

There is about 9 feet fall available below the Conowingo works, but it is believed that the conditions would not make it advisable to develop any power at that point.

At Conowingo the power house is located a short distance above Shures Landing. The building extends for a distance of about 500 feet, square across the stream from the west shore. The original development is to be of 25,000 horsepower, but provision is made in the power house for the development of 10,000 additional horsepower. From the river end of the power house the dam extends upstream

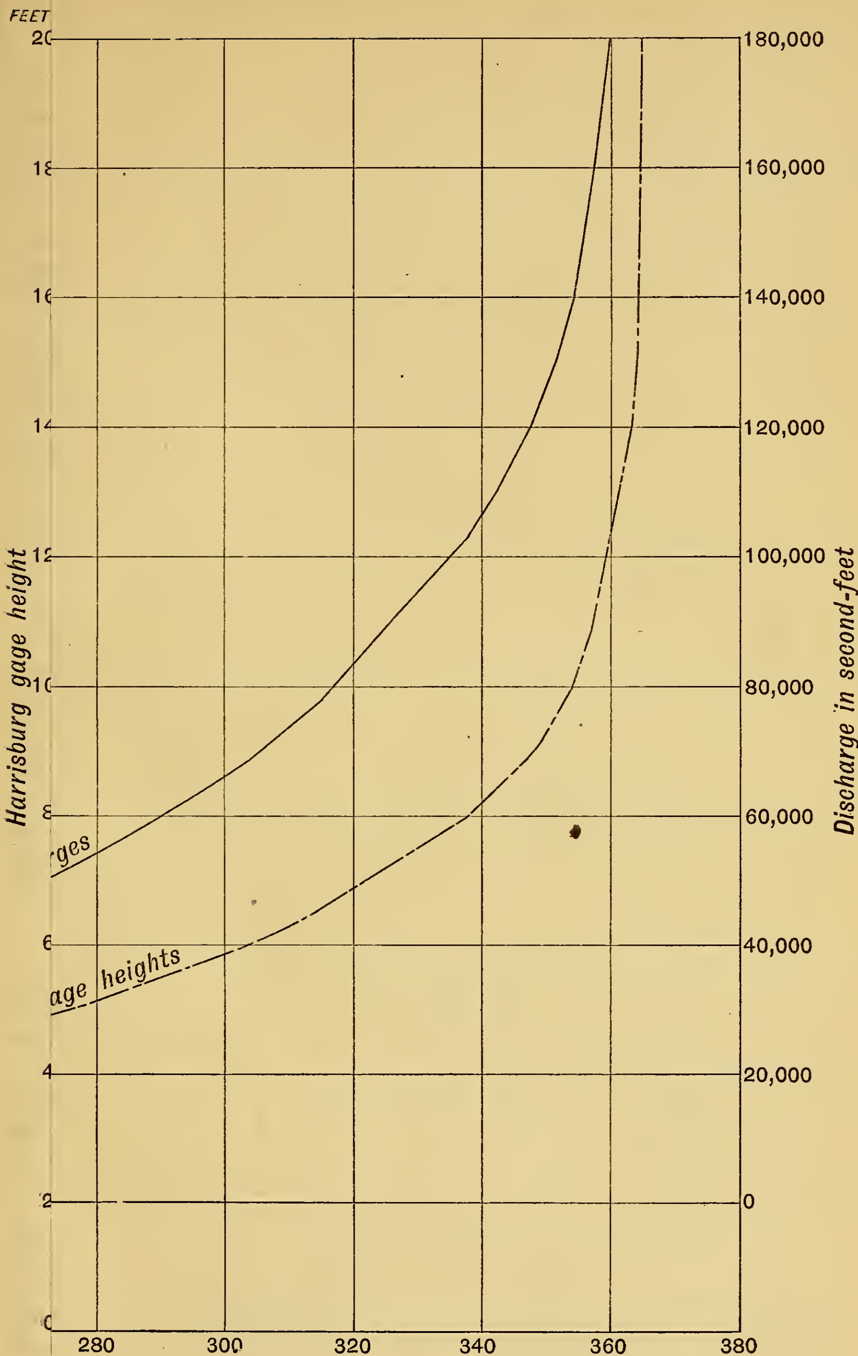
a distance of 1,200 feet, the crest being at an elevation of 50.5 feet. The dam then turns toward the foot of McDowells Island, 800 feet away; thence it follows the center of McDowells Island for 3,600 feet to its head, and thence it goes diagonally to the east shore, a distance of 2,600 feet. The last 7,000 feet have their crest at an elevation of 43 feet, except 200 feet close to the high part of the dam, where a spillway for ice has been located, its crest being at an elevation of 41 feet. A needle dam will close this spillway at ordinary stages. The river above McDowells Island is over 3,000 feet wide and the dam forms a pool over 4 miles long. It has a sufficient rollway to pass the highest known floods without endangering the riparian property above it. The high part of the dam and the McDowells Island section are 8 feet wide on the crest. The remainder of the dam has a crest 12 feet wide. The whole dam will be of rubble, with ashlar facing on the downstream side. Borings have shown that a continuous rock bottom will be obtained on McDowells Island at an average depth of 11 feet. The generating plant will probably be divided into 1,250 kilowatt units. The turbines will be vertical, with draft tube. One pair of turbines will serve each dynamo, the connection between turbines and horizontal shaft of dynamo being made by two crown wheels engaging bevel gears on this shaft.

The working head will be 34 feet at low water and 30 feet at ordinary stages.

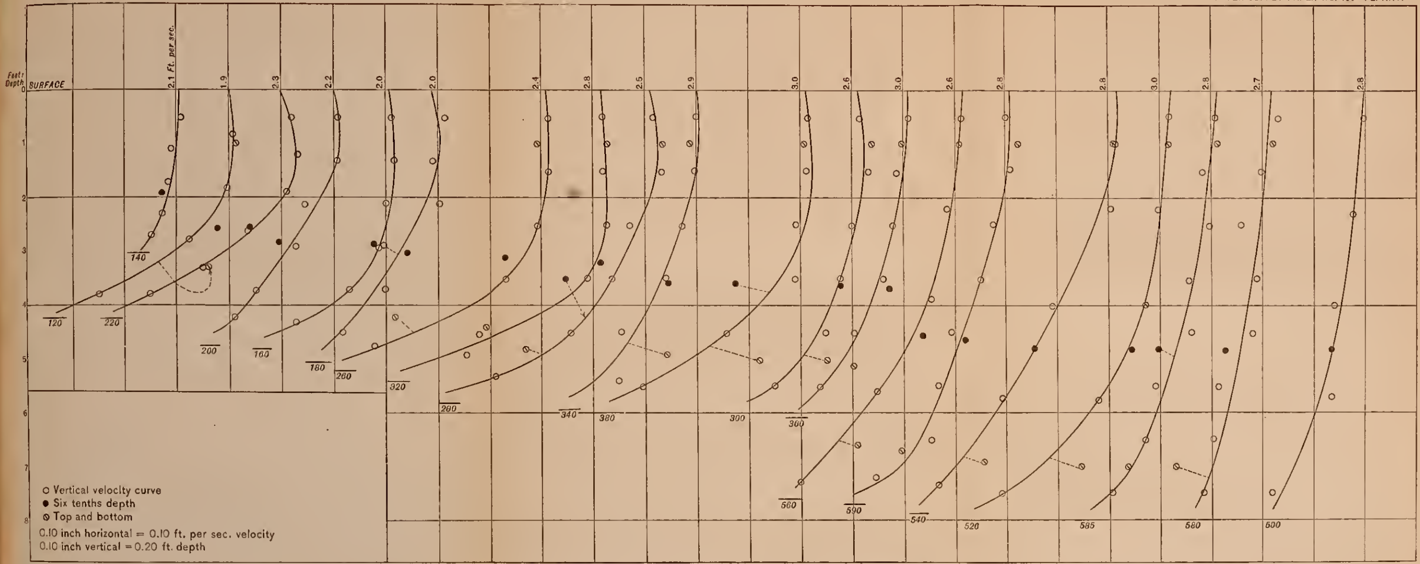
The Turkey Hill plant is located between Turkey Hill and Safe Harbor, on the east side of the river. At Turkey Hill the river is about 1 mile wide, and a low diverting dam about 5 feet high will form a large pond above it. This pond extends to Columbia, a distance of 5 miles, and its width varies between 1 and 2½ miles. The head and tail race canals are formed by an embankment paralleling the railroad track and forming a canal varying from 190 to 250 feet in width at the bottom. This embankment is about 3 miles long. It is composed of a river wall in cement battering 1½ inch per foot on the river side and 2½ inches on the back. Next to this is the loose rock embankment proper, 40 wide on top and sloping 1 to 1 on the power-canal side. This mode of construction will meet the impact of the ice and prevent it from overtopping the embankment. At the main dam, and close to the head works, there will be a raft chute and a raft channel leading from it and close to the embankment on the river side. The average working head will be 30 feet, and the power house will be located at Star Rock.

DURATION OF THE STAGES OF THE LOWER SUSQUEHANNA.

In order to show the mean conditions and the duration of flow which have existed on the lower Susquehanna River during the last twelve years—1891 to 1902, inclusive—the curves in Pl. XXVII have been constructed. The dotted-line curve is plotted with gage heights as ordinates, and with the number of days during the mean year on which the stage of the river was less than the given gage height as abscissæ. The full-line curve shows the number of days during the mean year when the discharge was below any given amount. In the preparation of these curves the Harrisburg gage heights for each year, as shown on pages 108 to 114, were tabulated according to magnitude. The number of days during the year when the water stood at each gage height were then tabulated, and from these the number of days during the year when the river was lower than the various gage heights was determined. The curves were constructed from the mean of these yearly tables, and in the case of the full-line curve the discharges as given in the rating table on page 115 were substituted for the gage heights.

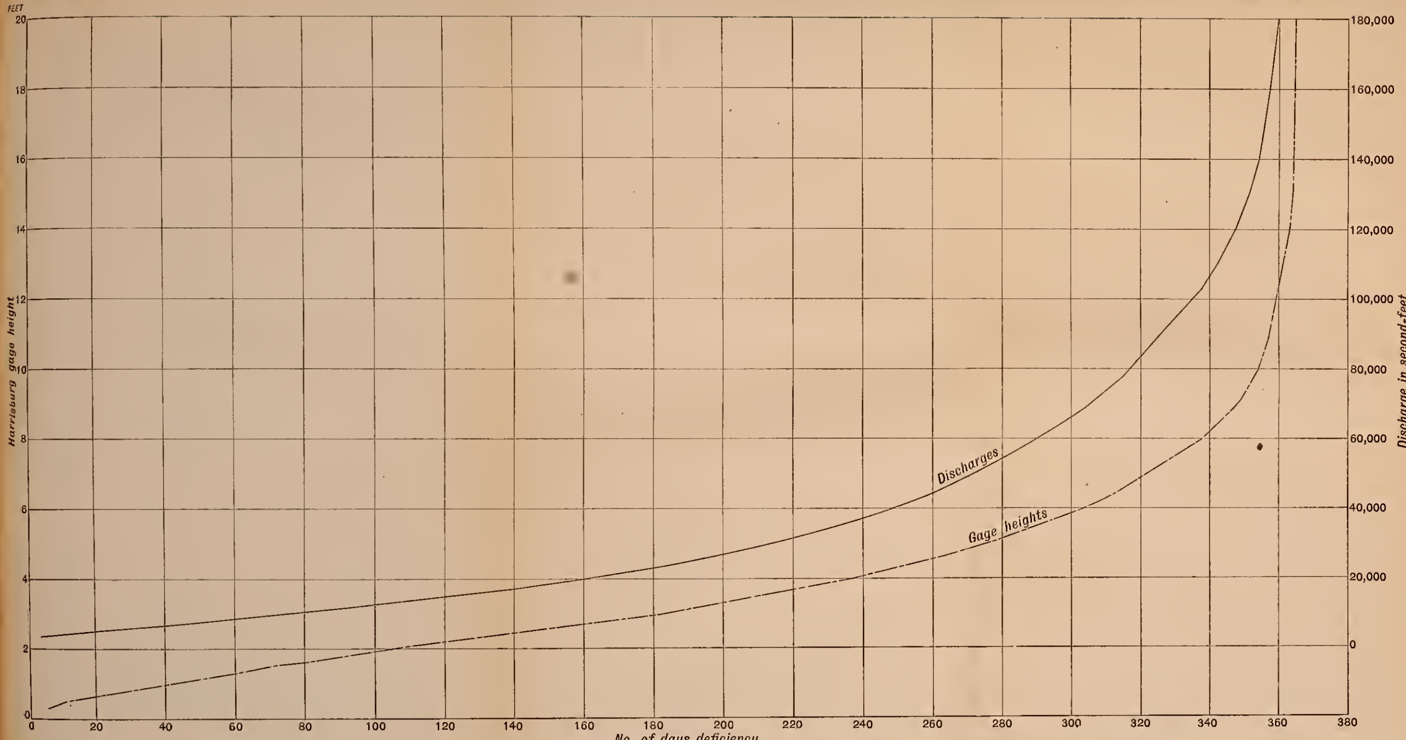


SBURG FOR 1891-1902, INCLUSIVE.



VERTICAL VELOCITY CURVES OF SUSQUEHANNA RIVER AT HARRISBURG PA.

Note: Curves are referred to the vertical lines nearest their tops. Station numbers are at the foot of the curves. Horizontal lines at the foot of the curves are at the river bottom. The curves terminate at their tops with the surface of the water.



CURVES SHOWING MEAN DURATION OF THE VARIOUS STAGES AND DISCHARGES OF SUSQUEHANNA RIVER AT HARRISBURG FOR 1891-1902, INCLUSIVE.

To use the two curves in conjunction with each other, enter the diagram with a certain gage height, find where it intersects the gage-height curve, then follow the ordinate of this intersection until it cuts the discharge curve, and the discharge for that particular gage height is found on the right side of the diagram.

Assuming that the discharges at the various points in this portion of the river vary in proportion to the drainage area above, one can readily determine by the use of the curves the conditions which may reasonably be expected at any point below Harrisburg. For example, suppose one wishes to know how many days during the mean year the discharge will be less than 5,500 second-feet at the Pennsylvania-Maryland line, where the drainage area is 27,150 square miles, or 13 per cent more than at Harrisburg. As the drainage area at Harrisburg is 88.6 per cent of that at the State line, 5,500 second-feet would correspond to a discharge of 4,870 second-feet at Harrisburg. From the full-line curve on Pl. XXVII we find that for twenty days during the mean year the discharge is less than 4,870 second-feet at Harrisburg, or 5,500 second-feet at the Maryland-Pennsylvania line.

By applying the following simple rule for horsepower it is possible to determine the probable power which could be developed during a mean year at any point in the lower Susquehanna:

Rule: Horsepower on the turbine shaft equals the discharge in second-feet multiplied by the fall divided by 11. This is based upon an assumption of 80 per cent efficiency for the turbines.

Applying this to the above example, we find that for three hundred and forty-five days during the mean year 500 horsepower for 80 per cent efficiency can be developed for each foot fall at the Maryland-Pennsylvania line.

RULES FOR ESTIMATING DISCHARGE.

The approximate mean monthly discharge in second-feet for any stream in the Susquehanna drainage basin, may be determined in either of two ways—

First. Its drainage area in square miles can be taken from the table on page 15, or measured on a map, and multiplied by the monthly run-off in second-feet per square mile given in the tables of the nearest gaging station.

Second. The monthly rainfall in inches for the district, as determined from the tables on pages 161 to 171, can be multiplied by the per cent of run-off for that month at the nearest of the three gaging stations—Wilkesbarre, Williamsport, or Harrisburg—giving the total monthly run-off in inches. This result multiplied by one of the following coefficients gives the mean monthly run-off in second-feet per square mile:

For month of 28 days	0.9603
For month of 30 days	.8963
For month of 31 days	.8674

The drainage area in square miles may be found as before, and if multiplied by the above product will give the mean discharge of the stream for that month in second-feet.

The horsepower may then be computed by the rule on page 203.

TABLES SHOWING DEVELOPED HORSEPOWER AND ELEVATIONS.

Horsepower developed in New York on Susquehanna River and tributaries.[a]

County.	Grist and flour mills.		Sawmills.		Miscellaneous.[b]		Total horsepower in county.
	Number of mills.	Total horsepower.	Number of mills.	Total horsepower.	Number of mills.	Total horsepower.	
Broome	13	840	9	291	3	33	1,164
Chemung	9	426	0	0	0	0	426
Chenango	20	963	23	759	6	163	1,885
Cortland	12	668	11	463	4	77	1,208
Delaware	9	314	10	276	0	....	590
Madison	9	367	8	359	2	175	901
Otsego	23	748	35	1,453	2	155	2,356
Schoharie	0	....	2	45	0	....	45
Steuben	23	1,155	3	121	6	27	1,303
Tioga	12	402	1	55	1	40	497
Total in State	130	5,883	102	3,822	24	670	10,375

[a] From manuscript schedules of the Twelfth Census.

[b] Includes woolen mills, tanneries, printing, cordage, and carriage works.

Horsepower developed in Pennsylvania on Susquehanna River and tributaries.[a]

County.	Flour and grist mills.		Sawmills.		Creameries and paper mills.		Electric power plants.		Total horse-power in county.
	Number of mills.	Total horse-power.	Number of mills.	Total horse-power.	Number of mills.	Total horse-power.	Number of mills.	Total horse-power.	
Adams	24	734	5	90					824
Bedford	34	699	5	100					799
Blair	26	597	2	40	1	25			662
Bradford	29	1,175	5	186					1,361
Cambria	4	111	8	218					329
Center	26	1,022	7	125	1	10			1,157
Clearfield	11	350	7	210					560
Clinton	11	451	6	213	1	120			784
Columbia	35	1,217	9	166	2	270			1,653
Cumberland	40	1,179	1	20	2	355	1	121	1,675
Dauphin	39	1,004	4	63			2	360	1,427
Elk	1	13							13
Franklin	9	169	1	10					179
Fulton	2	51	2	27					78
Huntingdon	30	979	2	40					1,019
Juniata	20	487	2	50					537
Lackawanna	7	324	3	90					414
Lancaster	176	5,451	11	667	9	225	4	1,262	7,605
Lebanon	22	615	2	30					645
Luzerne	24	712	8	205	1	125	1	208	1,250
Lycoming	31	1,530	6	140					1,670
Mifflin	16	605							605
Montour	6	135							135
Northumberland	22	445							445
Perry	31	697	7	154					851
Potter	1	20							20
Snyder	21	488	6	176					664
Schuylkill	17	277	2	45					322
Sullivan	7	224	5	129			1	250	603
Susquehanna	29	965	17	619			1	275	1,859
Tioga	15	554	1	55					609
Union	18	632	2	32					664
Wyoming	23	835	5	194					1,029
York	145	3,596	8	94	3	2,175	1	500	6,365
Total in State	952	28,343	149	4,188	20	3,305	11	2,976	38,812

[a] From manuscript schedules of the Twelfth Census.

Water power used for electric light and power development in Susquehanna drainage.[a]

Name of establishment.	County.	Post-office.	Power.					
			Water wheels.		Steam.		Electric.	
			Number.	Power.	Number.	Power.	Number.	Power.
West Earl Electric Light and Power Co.	Lancaster	Brownstown	1	50	----	------	2	50
Eagles Mere Light Co	Sullivan	Eagles Mere	1	250	----	------	1	100
Harrisburg Light, Heat and Power Co.	Dauphin	Harrisburg	4	300	10	2,980	38	3,936
Lancaster Electric Light, Heat and Power Co.	Lancaster	Lancaster	8	1,050	1	325	12	1,762
Manheim Electric Light, Heat and Power Co.	do	Manheim	2	100	1	150	1	100
Millersburg Electric Light, Heat and Power Co.	Dauphin	Millersburg	2	60	2	175	2	250
Delta Electric Power Co	York	Peach Bottom	2	500	----	------	1	470
John Hosfeld Co	Cumberland	Shippensburg	4	121	1	40	4	200
Strasburg Electric Light Plant	Lancaster	Strasburg	2	62	----	------	1	65
Susquehanna Electric Light, Heat and Power Co.	Susquehanna	Susquehanna	1	275	2	320	4	294
White Haven Electric Illuminating Plant.	Luzerne	Whitehaven	2	208	----	------	4	270
Total			29	2,976	17	3,990	70	7,497

[a] From manuscript schedules of the Twelfth Census.

Approximate elevations and slope of Susquehanna River and North Branch.

Locality.	Distance from mouth.	Elevation above tide.	Distance between points.	Fall between points.	
	Miles.	*Feet.*	*Miles.*	*Feet.*	*Ft. per mile.*
Mouth	0	0			
Port Deposit	5	2	5	2	0.4
Stateline	15	69	10	67	6.7
Peach Bottom	18	85	3	16	5.3
Muddy Creek	21	98	3	13	4.3
McCalls Ferry	26	115	5	17	5.4
York Furnace	30	140	4	25	6.2
Safe Harbor	34	168	4	28	7.0
Turkey Hill	39	210	5	42	8.4
Columbia	45	225	6	15	2.5
Head Conewago Falls	58	273	13	48	3.7
Harrisburg	73	290	15	17	1.1
Mouth Juniata River	88	336	15	46	3.1
Liverpool	107	379	19	43	2.3
Selinsgrove	126	422	19	43	2.3
Below Sunbury dam	131	423	5	1	.2
Below Nanticoke dam	189	509	58	86	1.5
Wilkesbarre	197	525	8	16	2.0
Pittston	204	539	7	14	2.0
Gardners Creek	210	551	6	12	2.0
Tunkhannock	228	587	18	36	2.0
Mehoopany Creek	239	615	11	28	2.5
Tuscarora Creek	249	630	10	15	1.5
Wyalusing	261	656	12	26	2.2
Rummerfield Creek	270	678	9	22	2.4
Big Wysox Creek	276	694	6	16	2.7
Towanda	281	706	5	12	2.4
Ulster Ferry	289	727	8	21	2.6
Mouth Chemung River	294	742	5	15	3.0
Athens	297	752	3	10	3.3

Approximate elevations and slope of Juniata River.

Locality.	Distance from mouth.	Elevation above tide.	Distance between points.	Fall between points.	
	Miles.	*Feet.*	*Miles.*	*Feet.*	*Ft. per mile.*
Mouth	0	336			
Millerstown dam, water below	16	380	16	44	2.7
Millerstown dam, crest	16	388	0	8	
Mifflin	34	417	18	29	1.6
Lewistown dam, water below	44	442	10	25	2.5
Lewistown dam, crest	44	450	0	8	
McVeytown	61	476	17	26	1.5
Newton Hamilton dam, water below	68	512	7	36	5.1
Newton Hamilton dam, crest	68	520	0	8	
Huntingdon dam, water below	90	±610	22	90	4.1
Huntingdon dam, crest	90	±622	0	12	

Approximate elevations and slope of Raystown Branch of Juniata River.

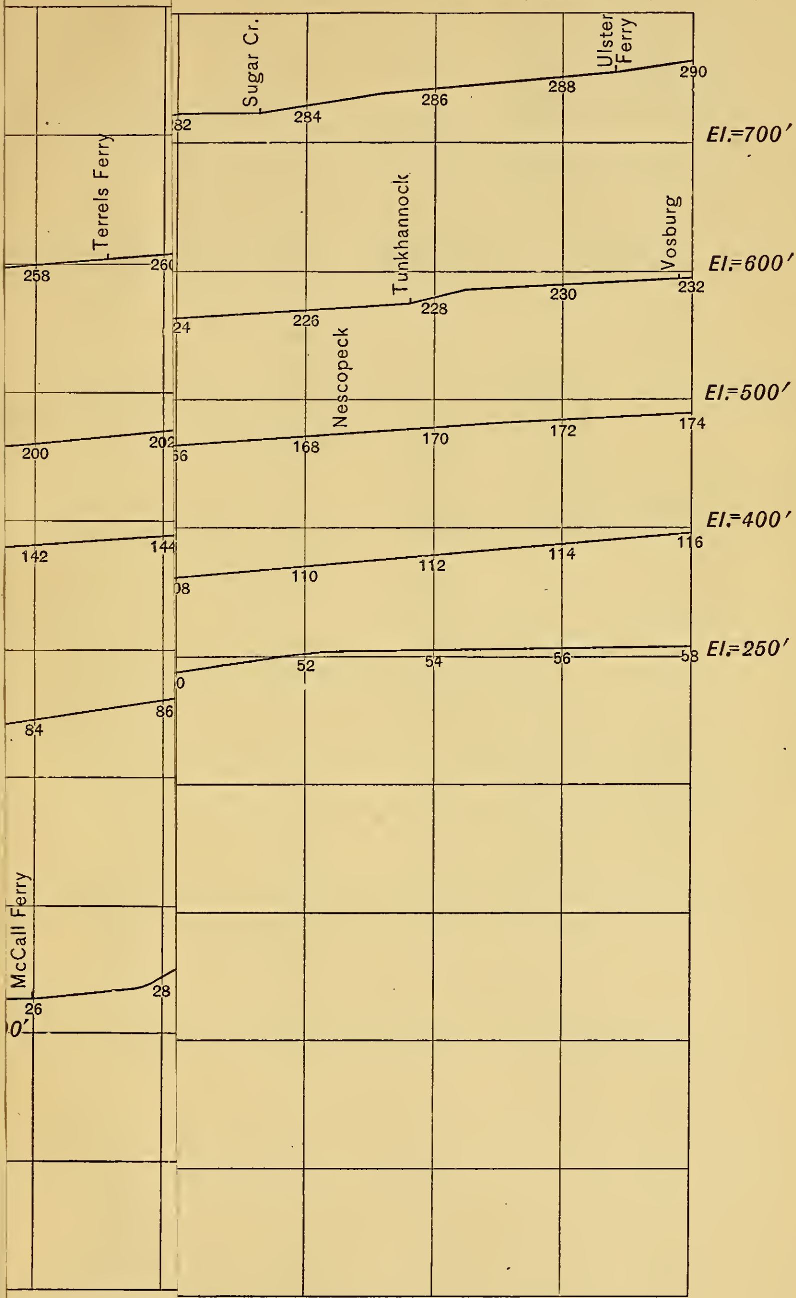
Locality.	Distance from mouth.	Elevation above tide.	Distance between points.	Fall between points.	
	Miles.	*Feet.*	*Miles.*	*Feet.*	*Ft. per mile*
Mouth	0	595			
Near Saxton	40	837	40	242	6.0
Pipers Run	53	891	13	54	4.2
Mount Dallas	79	1,016	26	125	4.8

Approximate elevations and slope of Frankstown Branch of Juniata River.

Locality.	Distance from Huntingdon.	Elevation above tide.	Distance between points.	Fall between points.	
	Miles.	*Feet.*	*Miles.*	*Feet.*	*Ft. per mile.*
Huntingdon dam, crest	0.0	622	----------	--------	---------
Piper's dam, water below	2.5	628	2.5	6.0	2.4
Piper's dam, crest	2.5	636	0	8.0	---------
Petersburg dam, water below	4.1	641	1.6	5.0	2.1
Petersburg dam, crest	4.1	648	0	6.5	---------
Big Water Street dam, water below	10.0	693	5.9	45.0	7.6
Big Water Street dam, crest	10.0	712	0	19.3	---------
Little Water Street dam, water below	12.4	714	2.4	2.0	.8
Little Water Street dam, crest	12.4	726	0	12.0	---------
Willow dam, water below	14.4	728	2.0	2.0	1.0
Willow dam, crest	14.4	741	0	13.0	---------
Donnelly's dam, water below	17.0	770	2.6	29.0	11.2
Donnelly's dam, crest	17.0	784	0	14.0	---------
Smoker's dam, water below	18.7	787	1.7	3.0	1.7
Smoker's dam, crest	18.7	799	0	12.0	---------
Mud dam, water below	20.1	800	1.4	1.0	.7
Mud dam, crest	20.1	808	0	7.5	---------
Williamsburg dam, water below	23.0	831	2.9	23.0	7.9
Williamsburg dam, crest	23.0	839	0	10.0	---------
Threemile dam, water below	24.1	839	1.1	0	0
Threemile dam, crest	24.1	856	0	17.5	---------
Crooked dam, water below	27.2	856	3.1	0	0
Crooked dam, crest	27.2	866	0	10.0	---------
Frankstown dam, water below	33.5	895	6.3	29.0	4.6
Frankstown dam, crest	33.5	899	0	3.5	---------
Hollidaysburg dam, water below	36.4	923	2.9	24.0	8.3
Hollidaysburg dam, crest	36.4	927	0	4.5	---------

Elevation and slope of West Branch of Susquehanna River.

Locality.	Distance from mouth.	Elevation above tide.	Distance between points.	Fall between points.	
	Miles.	*Feet.*	*Miles.*	*Feet.*	*Ft. per mile.*
Mouth	0	429			
Lewisburg dam, water below	7	431	7	2	0.3
Lewisburg dam, crest	7	434	0	3	
Muncy dam, water below	23	462	16	28	1.8
Muncy dam, crest	23	469	0	7	
Williamsport dam, water below	39	498	16	29	1.8
Williamsport dam, crest	39	508	0	10	
Lock Haven dam, water below	65	539	26	31	1.2
Lock Haven dam, crest	65	550	0	11	
Queen's Run dam, water below	69	551	4	1	0.2
Queen's Run dam, crest	69	557	0	6	
Keating	105	695	36	138	3.8
Curwinsville	160	1,117	55	422	7.7


Sugar Cr.
Ulster Ferry
Terrels Ferry
Tunkhannock
Vosburg
Nescopeck
McCall Ferry
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El.=600′
El.=500′
El.=400′
El.=250′
282 284 286 288 290
258 260
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84 86
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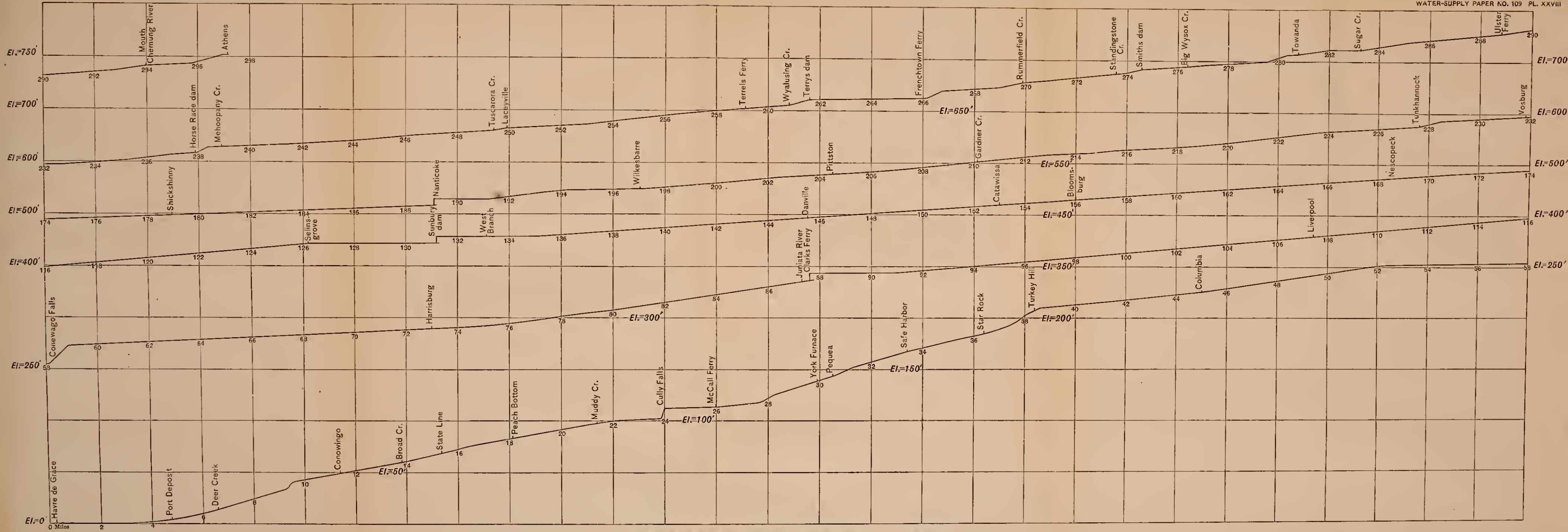
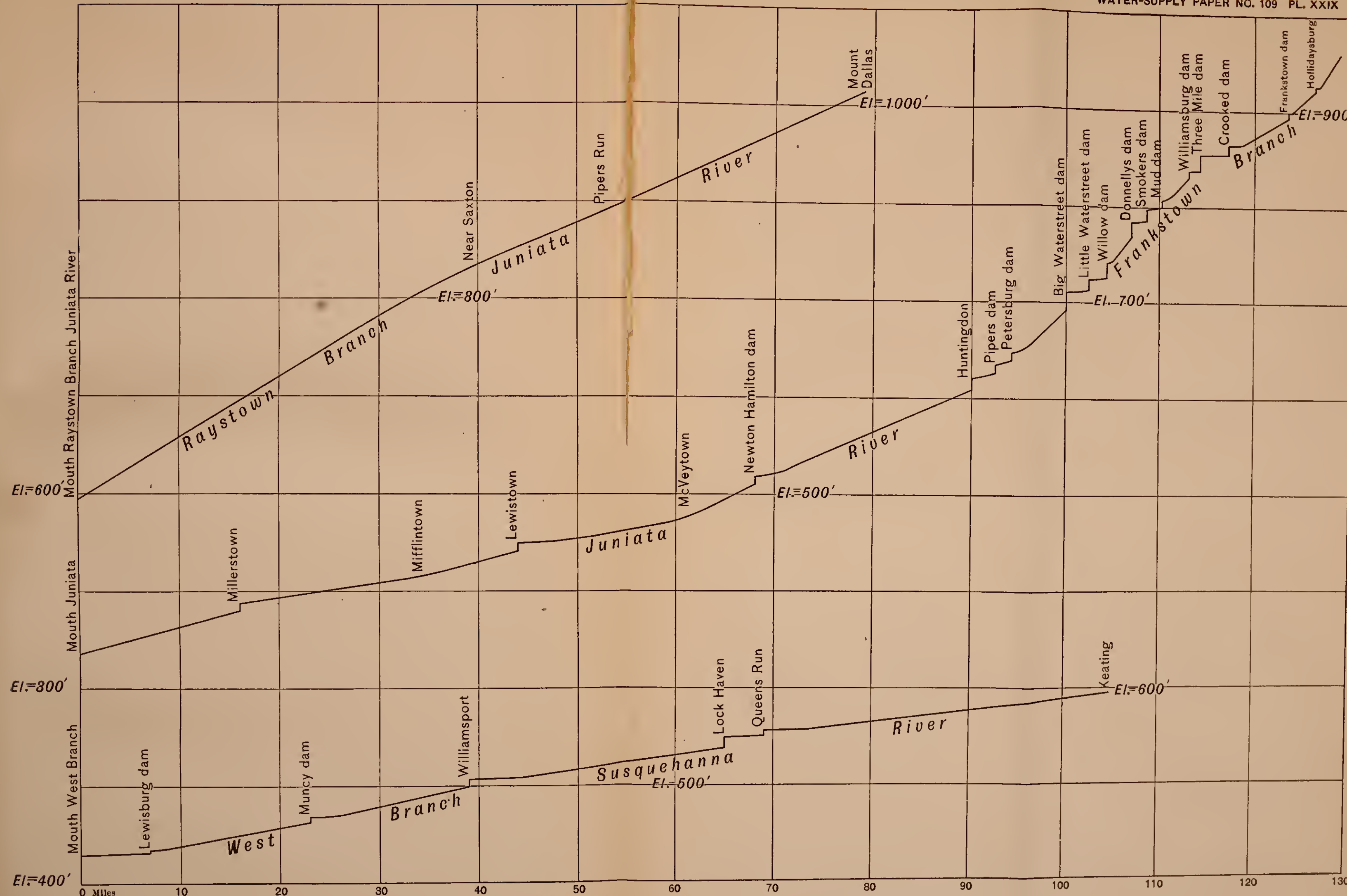
26 28

USQUEHANNA



PROFILE OF SUSQUEHANNA RIVER FROM MOUTH TO ATHENS PA.



PROFILES OF SOME OF THE TRIBUTARIES OF SUSQUEHANNA RIVER.

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O

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Correspondence should be addressed to
The Director,
United States Geological Survey,
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